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INDEX.

Absorbent Powers of Spongicles of Roots....... 222
Abuse and use of Alcohol.................. 97
Acclimated and Indigenous Produce of Cuba... 321
Achillea Rosea.................. 135
Address New Years.................. 41
Address Wilder's.................. 437
Ad Interim Report Penn. Hort. Society,......... 128
Advertisements,..... 52, 102, 196, 244, 294, 342, 389
Age of Plants.................. 281
Agricultural Association of Kentucky......... 338
Agricultural Education.................. 145
Agricultural Orators.................. 504
Agricultural Papers.................. 484
Agricultural Shows for 1854.................. 385
Agricultural Society Cayuga County............ 147
Agricultural Society Connecticut State......... 194
Agricultural Society Franklin County.......... 194
Agricultural Society Montgomery............... 48
Agricultural Society of N. Y.................. 48
Agricultural Society U. S.......... 47, 97, 146, 194
Agricultural Society Wisconsin................ 48
Agricultural Survey of Ohio.................. 147
Agriculture and Botany.................. 279
Agriculture Chinese.................. 91
Agriculture Franklin's Opinion of.............. 458
Ariculture Imp. of Entomology to............. 174
Agriculture Indiana State Board of............ 99
Agriculture in Maine.................. 147
Agriculture Ohio State Board of.............. 48, 99
Agriculture Relations of Sum. Clim. of 1853.... 156
Agriculture Scientific.................. 415, 467
Air to Plants.................. 563
Alcohol use and Abuse of.................. 97
Allen's Report, House Varieties Grapes......... 527
Amazon Exploration of Valley of............... 97
American Hand Book of Trees.................. 97
American Pomological Society........ 242, 338, 446
American Species Vitis.................. 81
Am. Wine Growers Asso.... 242, 292, 335, 386, 445
Analysis of Pear, Apple and Grape............. 519
Animal Manures.................. 362
Annuals.................. 373
Annuals Cuttings of.................. 550
Annuals Half Hardy.................. 556
Antirrhinum.................. 231
Apologetic.................. 382
Apples from Seed.................. 312
Apples for Ohio. List of.................. 407
Apple, Grape and Pear, Analysis of............. 519
Apples and Nuts.................. 514
Apples Southern.................. 95
Apple St. Lawrence.................. 96
April Opening of flowers in.................. 179
Arboretums Remarks on.................. 262
Architecture Rural,.................. 47
Architecture an Art.................. 215
Architecture Beauty in.................. 111, 303
Articles Deferred.................. 146
Asparagus.................. 519
Association Agricultural Kentucky............. 338
Association Wine Growers, 48, 242, 292, 338, 386, 445
Astoria Letter from.................. 17
Autumn.................. 299
Babylon Fertility of Plains of................. 176
Banana The.................. 180
Balsam Garden.................. 550
Bark Louse.................. 40
Baswood Paper.................. 465
Bean Sejour—Guernsey.................. 554
Beauty in Architecture.................. 111, 303
Bees Shading.................. 518
Birds British Song.................. 218
Blackberries Their Culture.................. 126
Blight Pears.................. 170
Blue Flowers.................. 279
Board of Agriculture, Indiana State............ 99
Board of Agriculture, Ohio State............ 48, 91
Books New.................. 97, 243
Book Notices.................. 190
Book of American Trees.................. 99
Border Plant Pulmonaria.................. 287
Botanicœ Notœ.................. 84
Botanical Association Cincinnati.............. 56
Botanical Gossip.................. 132
Botanical Knowledge.................. 27
Botanical Names A Few.................. 82, 129
Botanical Nomenclature Errors in.............. 177
Botanical Science Importance of............... 142
Botanists To.................. 85
Botany & Agriculture.................. 279
Botany Geological,.................. 79
Brazil, Planting Tea in.................. 509
Bread Plants, Geography of.................. 267
British Song Birds.................. 218
Brooklyn Horticultural Society.................. 292
Buildings, Cheap Wash for Wooden.............. 530
Buildings, Principles of Composition as applied to 165
Butter.................. 359
Butterfly Plant.................. 371
Cabbages, Gressard.................. 33
California Horticultural Society............... 147
California, Paper Making in.................. 466
California Plants.................. 85, 131, 233
California Sassafras.................. 131
California Strawberries.................. 64
California Sugar Plants.................. 37
California, Vineyards of Northern.............. 309
Camellia.................. 345, 518, 530, 541
Camellia, R. R. Scott,.................. 541
Camellia, Valuable.................. 518
Carbon.................. 317
Carpenter on use and abuse of Alcohol......... 97
Cayuga County Agricultural Society............ 147
Celery and its Culture.................. 403
Cells, Organic Chemistry of.................. 229
Cerasus Ilicifolius.................. 85
Changing Seed.................. 336
Characteristics of Good Vegetables............ 330
Cheap Wash for Wooden Buildings.............. 530
Chemistry of Nature.................. 514
Chemistry of Organic Cells.................. 229
Chester Co. Horticultural Society.............. 338
Chickory Cultivation.................. 140
Chinese Agriculture.................. 91
Chinese Primrose.................. 425
Choice Culture.................. 511, 535
Choice Culture Fruit Report.................. 511
Choice Pears.................. 162
Chunnenuggee Horticultural Society,............ 292
Chrysanthemum.................. 367, 475, 559
Chrysanthemums, Culture by Cuttings.......... 560
" " by Suckers and Divisions.................. 562
Chrystal Palace, its Planting.................. 539
Cincinnati Botanical Association.............. 46
Cincinnati Horticultural Society, Transactions of.......... 48, 99, 194, 242, 290, 338, 384, 431
Cincinnati, Strawberries of.................. 286
Cisterns and Rain Water.................. 281
Clearings, New Plants on Forest............... 128
Climate of 1853, Agricultural Relations of the Summer.................. 156
Climate, Summer.................. 192
Clubs, Farmer's.................. 357
Coffee, Substitute for.................. 427
Coldest Days.................. 283
Cold on Peaches.................. 114
Coloring Green Tea.................. 515

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Colors of Flowers.... 519
Columbus Horticultural Society.... 194
Colza or Rape.... 515
Committee Mass. Horticultural, So. Report of.. 531
Committee Penn. Hort. Soc. Report of Fruit... 128
Complimentary Impromptu.... 143
Composition Principles of, as applied to Buildings.... 165
Concord Grape.... 287, 385, 429, 526
Condition of Happiness, Labor.... 377
Condition of Heat and Radiation.... 399
Connecticut State Agricultural Society.... 194
Conveniences, Rural.... 523
Convention, Pomological.... 48
Convention, The Trees in.... 502
Convention, Wisconsin Fruit Growers.... 48
Correction.... 143
Correspondence.... 132, 190, 193, 231
Correspondence, Editorial.... 143, 239, 288, 382
Cotta, Terra.... 428
County Cayuga Agricultural Society.... 147
Cow Tree.... 513
Crop, The Grape.... 337
Crust of the Earth.... 344
Cuba, Products of.... 321
Cultivation Chickory.... 140
Cultivation of Liquorice.... 73
Cultivation, Pears for General.... 492
Culture, Blackberries Their.... 198
Culture Camellia at Kazan.... 530
Culture, Choice.... 511, 535
Culture Choice, Fruit Report.... 511
Culture Chrysanthemums.... 559, 560, 562, 563
Culture, Grape,.... 149, 508, 526
Culture, Grape on Kelley's Island.... 69
Culture, Grape in Tennessee.... 311
Culture, The Hyacinth Pot,.... 139
Culture of Celery.... 403
Culture of Rural Taste.... 104
Cunninghamia, Lanceolata,.... 135
Curculio.... 521
Cuttings of Annuals.... 550
Cuttings Chrysanthemums.... 560
Cuttings, Management of.... 221
Cuttings Propagation.... 557
Cuttings, Striking in Water.... 263
Cyclamen Persian.... 233
Days, Coldest.... 283
Deferred Articles.... 146
Delaware Co. Horticultural Society.... 338
Depth of Planting.... 530
Describe a Plant, How to.... 315
Destroy Snails.... 296
Diffusion of Seed.... 320
Digging, The Garden Winter.... 14
Discussion on Grafting.... 494
Disease of Stone Fruit.... 520
Disease. The Grape.... 23, 285
Disease. The Grape in Europe.... 23
Distances for Planting Trees.... 506
Distribution of Plants.... 39
Division Chrysanthemums.... 562
Dr. Mosher, Grape Culture.... 508
Drought, The.... 449
Drouth, Prevention of.... 418
Earth, Crust of the.... 344
Editorial Correspondence.... 143, 239, 288, 382
Editorial Notes.... 241
Editorial Remarks.... 51, 101
Education, Agricultural.... 145
Effects of the Stock on the Fruits.... 496
Entomological Survey of N. Y.... 472
Entomology.... 174
Errors Popular in Bot. Nomenclature.... 177
Everybody's Weatherometer.... 237
Excellence, Standards of Vegetables.... 61
Exhibition Cin. Hort. So.... 431
Exhibition, French, of 1855.... 374
Exhibitions, Hort.... 147
Exhibitions, Winter.... 95
Experimental Farm.... 47
Experiments—Potatoes grown in Tan.... 524
Exploration of Valley of Amazon.... 97
Fairs, Indiana State.... 147
Fair, Iowa State.... 435
Fair, Missouri State.... 48
Fairs, State.... 97, 147, 435
Fallacies, Popular.... 77
Fall Exhibition of the Cin. Hort. So.... 431
False and Real Beauty in Architecture.... 303
Farmers' Clubs.... 357
Farm, Experimental.... 47
Farmer, Indiana.... 291
Farmers and Gard. Meetings.... 96
Fences.... 306
Fertility of the Plains of Babylon.... 176
Few Botanical Names.... 82, 129
Fig, the.... 176
Fixing Agents, Manures.... 522
Floral Periods.... 274
Flowering of our Native Plants.... 132, 179, 277
Flowering Shrubs.... 146
Flowers, Blue.... 276
Flowers, Colors of.... 519
Flowers in Palestine.... 191
Flower Market.... 192
Flowers opening in April.... 179
Flowers opening in May.... 228
Flowers opening in June.... 277
Flowers, Wild, for the Garden.... 132
Food of Plants.... 34
Forest Clearings, New Plants on.... 128
Forest Trees.... 467
Forest Trees from Seed.... 220
Fox Grape.... 231
France, letter from.... 167
Franklin Co. Agri. Society.... 194
Franklin's Opinion of Agriculture.... 468
French Exhibition of 1855.... 374
French Posts and Grape Stakes.... 375
Friends, Notice to Old.... 481
Frosts of Vallies.... 277
Fruit Com. Penn. Hort. So., Report of.... 128
Fruit, Disease of Stone.... 570
Fruits, Effect of the Stock on.... 496
Fruit Growers, Wisconsin, Convention of.... 48
Fruits in Oregon.... 531
Fruits, New.... 56
Fruit, Notes Historical.... 459
Fruit Prospects.... 18, 54, 192
Fruit Report.... 115, 511
Fruit Room.... 511
Fruit Room, Moorman's.... 499
Fruit Rooms, Keeping Pears.... 499
Fruits, Summer.... 337
Fruit Trees, Lime on.... 12
Fruits, Utility of, for food and preservation of Health.... 417
Fruits, Value of.... 532
Fruit, Vegetable and.... 17
Fungi, Remarks on the.... 419
Garden Balsam.... 550
Gardners and Farmers Meetings.... 96
Gardners, Mental Improvement of.... 562
Gardens of Kew, History of.... 378
Gardens, Plants for Grouping in.... 546
Garden, the Trenching.... 14
Garden, Wild Flowers for.... 132
General Cultivation, Pears for.... 492
Geography of the Bread Plants.... 26
Geological Botany.... 79
Geological Survey of Iowa.... 149
Geraniums, Seedlings, Old.... 547
Giant Root.... 31
Gigantea Washingtonia, Mammoth Trees.... 485
Ginseng.... 402
Good Vegetables, Characteristics of.... 332
Gossip, Botanical.... 13
Gossip, Orchard.... 14
Glance at Kew.... 535
Glass, Grapes Under.... 527
Grafting, Discussion on.... 493
Grafting, Grape.... 144
Grafting, Wax.... 309
Grape, Apple and Pear, Analysis of.... 516
Grape, Concord,.... 287, 385, 429
Grape Crop.... 339
Grape, Culture of, Kelly's Island.... 69
Grape Culture.... 149, 50
Grape Culture in Tenn.... 311
Grape Disease.... 23, 285
Grapes for Wine.... 464
Grape, Fox.... 231
Grapes, Large yield of.... 465
Grape, Layering.... 146
Grapes, House Varieties.... 527
Grapes, Hybrid.... 528
Grape Malady.... 23, 167
Grapes, New.... 24
Grapes, Open Culture.... 526

Grapes, Southern........ 59
Grape Stakes and French Posts........ 375
Grapes under Glass........ 525
Grape Vine in Warm Countries........ 463
Grape and Vineyard........ 1, 53, 101, 149, 197
Grass and Cabbages........ 33
Green Houses........ 543
Green Houses, Heating Small........ 38
Green Houses, Temperature of........ 548
Green Tea, Coloring........ 515
Ground Nut........ 70
Grouping in Gardens, Plants for........ 546
Growing the Chrysanthemum, Modes of........ 475
Growth of Timber........ 213
Growth, Vegetable........ 479
Guernsey, Beau Sejour........ 454
Hand Book of Trees, Amer........ 97
Half-Hardy Annuals........ 556
Half-Hardy Plants, Wintering........ 548
Happiness, Labor a Condition of........ 377
Hardy Magnolias........ 368
Health, Preservation of........ 405, 417
Heating Small Green Houses........ 38
Heat, Solar........ 209, 251, 300, 349, 389
Heat, Radiation and Condition........ 399
Heaths and Oranges........ 297
Hedging........ 240
Hedges, Maclura........ 116
Hedges in Ohio........ 341
Historical Fruit Notes........ 459
History of the Kew Garden........ 378
Hops........ 176
Hort. Exhibitions........ 147
Hort., Lectures on........ 289
Hort. Notes........ 382
Horticultural Novelties........ 10
Hort. Society, Alton........ 48
Hort. Society, Brooklyn........ 292
Hort. Society, California........ 147
Hort. So. Chester Co........ 338
Hort. Society, Chunnenuggee........ 292
Horticultural Soc'y Cincin., transactions of, 48, 99, 194, 242, 290, 338, 384
Hort. Society, Columbus........ 194
Hort. Society, Delaware Co........ 338
Hort. Society, Kentucky........ 242, 386
Hort. Society, Mass........ 386, 525, 531
Hort. Society, Mobile........ 48, 242
Hort. Societies, New........ 95
Hort. Society, New Haven........ 147
Hort. Society, New York........ 147, 292, 336
Hort. Society Penn, Report of........ 24, 128
Hort. Society, Pittsburg........ 194
Hort. Societies, Suggestions........ 533
Hort. Society, Worcester........ 147
Horticulture in the South........ 97
House, Novelties at Sion........ 477
House Varieties Grapes........ 527
Hovey's Magazine........ 429
How to Describe a Plant........ 315
How and Where Orchard........ 151
Humbug of Many Varieties........ 503
Hyacinth, Pot Culture........ 139
Hybridizing........ 136
Hybrid Grapes........ 528
Ice Plant........ 31
Ilicifolius Cerasus........ 85
Illustrations, Our........ 280
Importance of Bot. Science........ 142
Importance of Entomology to Agri........ 174
Impromptu, Complimentary........ 143
Improvement of Young Gardeners........ 552
Indiana Farmer........ 291
Indiana State Board of Agriculture........ 99
Indiana State Fairs, Transactions........ 147
Indianapolis, Winter Show at........ 115
Indigenous and Acclimated Prod. of Cuba........ 321
Influence of Light on Vegetation. 203, 248, 297, 345
Injure Plants, Insects that........ 314
Insects........ 517
Insects that Injure Plants........ 314
Iowa, Geological Survey of........ 147
Iowa State Fair........ 435
Island, Kelly's........ 369
Ivy........ 581
Journal U. S. Agricultural So........ 146
June, Flowers Opening in........ 277
Kazan, Culture Camelia at........ 530
Keeping Pears........ 499
Kelly's Island........ 369
Kelly's Island, Grape Culture on........ 69, 369
Kentucky Agri. Ass........ 338
Kentucky Hort. Society........ 242, 386
Kew Gardens, History of........ 378
Kew, Glance at........ 536
Kinds of Sugar Considered........ 351
Knowledge, Botanical........ 27
Knowledge, Uses of........ 290
Labor a Condition of Happiness........ 377
Ladies, A Word for the........ 406
Large Yield of Grape........ 465
Lanceolata Cunninghamia........ 135
Layering Grape........ 149
Laying off Grape and Vineyard........ 101
Leaves, Sleep of........ 278
Lectures upon Hort........ 289
Letter from Mr. Longworth........ 286
Letter of Mr. Rehfuss........ 292
Letter from France........ 167
Letter on Pear........ 160, 203
Leuchars........ 543
Light, Influence on Vegetation... 203, 248, 297, 345
Lilly of the Valley, its Management and Culture........ 29
Lime a Manure........ 310
Lime on Fruit Trees........ 12
List of Apples for Ohio........ 497
List of Peaches........ 494
Live Hedges in Ohio........ 341
Locusts........ 521
Locusts, Seventeen-year........ 314
London Pomological So........ 539
Liquorice, Cultivation of........ 79
Louisville, Visit to........ 438
Louse Bark........ 40
Maclura Hedges........ 116
Magazine, Hovey's........ 429
Magnolias, Hardy........ 368
Maine, Agriculture in........ 147
Make Maclura Hedges, the Way to........ 116
Making Paper in California........ 406
Malady, the Grape........ 23, 167
Malaga Raisin Vineyard........ 423
Mammoth Trees........ 485
Management of Cuttings........ 221
Manure, Is Lime a........ 310
Manure, What is It........ 213
Manures........ 522
Manures, Animal........ 362
Manures, Special, for the Vine........ 68
Many Varieties, Humbug of........ 503
Market, Flower........ 188
Massachusetts Hort. Society........ 386, 525, 531
Materials, Waste........ 307
Matter, Vegetable Sources of........ 408
Maturing of Some Seeds, Time of........ 529
May, Flowers Opening in........ 290
McAvoy's Superior........ 8
Meetings, Farmers and Gardeners........ 96
Mental Improvement of Young Gardeners........ 552
Miscellaneous Notes........ 47
Miscellany (Advertiser)........ 178, 195, 243
Missouri State Fair........ 45
Mobile Hort. Society........ 48, 242
Modes of Growing the Crysanthemum........ 475
Montgomery Agricul. Society........ 4
Moorman's Fruit-Room........ 499
More Agri. Papers........ 484
Mr. Hovey and Concord Grape........ 385
Mr. Longworth, Letter from........ 286
Mr. Rehfuss........ 292
Names, Botanical, a few........ 82, 129
Native Plants, Flowering of...... 132, 179, 228, 277
Natural Prognostications of the Weather........ 237
Nature, Chemistry of........ 514
Nature, Study of........ 372
New Books........ 97, 241
New Haven Hort. Society........ 147
New Hort. Societies........ 95
New Plants........ 31, 88, 473
New Plants on Forest Clearings........ 128
New Year's Address........ 41
New York, Entomological Survey of........ 478
New York Hort. Society........ 147, 292, 336
New York State Agricultural Society........ 48
Nomenclature, Bot. Popular Errors in........ 177
Northern California Vineyards........ 308
Notæ Botanicæ........ 59
Notes, Editorial........ 242
Notes, Miscellaneous........ 47

Notes, Historical Fruit........ [illegible]
Notes, Horticultural........ [illegible]
Notes on Rare Plants........ 39
Notes, Promissory........ 46
Notice to Old Friends........ 481
Notices 201, 341
Notices of Books........ 199
Notices of this Work........ 293
Notices, Review........ [illegible]
Novelties at Sion House........ 477
Novelties, Horticultural........ 10
Number, Our Second........ 201
Nurseries, Troup Hill........ [illegible]
Nut Ground........ 70
Nuts and Apples........ 314
Obituary........ 47, 486
Ohio, Agricultural Survey of........ 147
Ohio, List of Apples for........ 497
Ohio, Live Hedges in........ 341
Ohio Pomological Society........ [illegible]
Ohio State Board of Agriculture........ 46, 99
Old Friends, Notice to........ 481
Old Geraniums, Seedlings........ 549
On Growth of Timber........ 213
Open Culture Grapes........ [illegible]
Opening Flowers in April........ 170
Opening Flowers in May........ [illegible]
Opening Flowers in June........ 277
Opinion of Agriculture, Franklin's........ 450
Oranges........ [illegible]
Oranges and Heaths........ 297, [illegible]
Orators, Agricultural........ 304
Oregon, Fruits in........ 421
Orchard........ 10, 64, 131, 248, 393
Orchard Gossip........ 10
Orchards, How and Where........ 131
Orchards, Sawdust for........ 173
Orchards, Why do you Plant One........ 64
Orchids........ 338
Organic Cells, Chemistry of........ [illegible]
Origin of Weeping Trees........ 279
Our Illustrations........ 200
Our Second Number........ 201
Palestine, Flowers in........ 191
Paper, Beerwood........ 486
Paper Making in California........ 466
Paper of Wood........ 204
Papers, Agricultural........ 464
Parsneps........ 75
Peaches, Golden........ 114
Peaches List of........ [illegible]
Peach Rot........ [illegible]
Peaches, Save Your........ 145
Peach Trees, Shortening in........ [illegible]
Peach Trellis of Thos. White........ 307
Pear, Apple and Grape, Analysis of........ 519
Pear Blight........ 170
Pears, Choice........ 101
Pears for General Cultivation........ 497
Pears, Keeping........ [illegible]
Pear, Letter on........ 104, 603
Pears on Quince Stock........ 90, 210
Penn Hort. Society, Report to........ 96, 188
Periods, Floral........ 274
Persian Cyclamen........ [illegible]
Pillar Roses........ [illegible]
Pinks, Propagation of........ [illegible]
Pittsburg Horticultural Society........ 184
Plains of Babylon, Fertility of........ 170
Planting, Depth of........ 539
Planting Crystal Palace........ 539
Planting Grape and Vineyard........ 301
Planting Tea in Brazil........ [illegible]
Planting Trees, Distances for........ [illegible]
Plants, Age of........ 281
Plants, Air to........ 363
Plants, Broad, Geography of........ 207
Plant, Butterfly........ 371
Plants, California........ 68, 131, 230
Plants, Distribution of........ 39
Plants, Flowering of Our Native. 128, 170, 226, 277
Plants, Food of........ 34
Plants for Grouping in Gardens........ 548
Plants, Half Hardy Wintering........ 548
Plant, How to Describe it........ 316
Plants in Pots and Management of Cuttings........ 281
Plants, Insects that Injure........ 314
Plants, New........ 31, 88, 473
Plants on Forest Clearings, New........ [illegible]
Plants, Potash and Soda in........ 67
Plants, Reproduction........ 257
Plants, Roots of........ 470
Plant Trees........ 228
Plant we Rear........ 173
Pollen........ 138
Pollen Saving........ 130
Pomological Society, American........ 248, 230, 446, 403
Pomological Convention........ 46, 446
Pomological Society, London........ 229
Pomological Society, Ohio........ [illegible]
Pompones........ 163
Popular Errors in Botanical Nomenclature........ 177
Popular Fallacies........ 77
Position, Selection of Soil and........ 1
Posts, Grape Stakes and French........ 373
Potash and Soda in Plants........ 67
Potatoes grown in Tan........ 324
Potato Seed, Sweet........ 487
Potatoes, Storing........ 531
Pot Culture—The Hyacinth........ 139
Pots, Plants in and Management of Cuttings........ 281
Powers Absorbent of Spongioles of Roots........ [illegible]
Preparation of Soil........ 38
Preservation of Health........ 365, 417
Prevention of Drouth........ 418
Primrose, Chinese........ [illegible]
Promissory Notes........ 46
Principles of Composition, as applied to Building........ 165
Products of Cuba........ 271
Prognostications of the Weather........ 98, 227
Progress of Scientific Agriculture........ 487
Propagation, Cuttings........ 357
Propagation of Pinks........ 265
Prospects, Fruit 1854........ 100
Pruning, Root........ 204
Pruning, The Orchard, Summer........ [illegible]
Pruning and Training Grapes........ 167
Pulmonaria as a Border Plant........ [illegible]
Question, Strawberry........ 148, 148
Quince, Pears on........ 90, 210
Radiation........ 349
Radiation and Condition of Heat........ [illegible]
Radish........ 176
Rain Water and Cisterns........ 281
Raisin Vineyard, Malaga........ [illegible]
Rape or Colza........ 516
Rare Plants, Notes on........ 39
Real and False Beauty in Architecture........ 303
Relations, Agri. of Sum. Climate 1853........ 159
Remarks, Editorial........ 51, 101
Remarks on Arboretums........ [illegible]
Remarks on Fungi........ 419
Renovation of Southern Soil........ 312
Report, Allen's House Varieties Grapes........ 287
Report, Fruit........ 118, 511
Report, Fruit Com. Penn. Hort. Society........ 188
Report of Com. Mass. Hort. Society........ 331
Report on Shade Trees........ [illegible]
Report, Pennsylvania Horticultural Society........ 96
Report, Wine Growers Association........ 445
Reproduction of Plants........ [illegible]
Review Notices........ 499
Rot, Fruit........ 511
Rooms, Fruit, Keeping Pears........ [illegible]
Room, Moorman's Fruit........ 489
Root Pruning........ 205
Roots, Absorbent Powers of Spongioles of........ [illegible]
Roots of Plants........ 470
Roses Achilles........ 138
Roses Pillar........ 99
Roses, Town........ 317
Rot of the Peach........ 408
R. R. Scott, Camellia........ 541
Rural Architecture........ 47
Rural Conveniences........ [illegible]
Rural Taste, Culture of........ 106
Salads in Winter........ 71
Samphire........ [illegible]
Sassafras, California........ 131
Saving Pollen........ 130
Save your Peaches........ 145
Sawdust for Orchards........ 173
Scraping and Washing Trees........ [illegible]
Science, Botanical Importance of........ 149
Scientific Agriculture........ 416, 487
Second Number........ 201
Seed, Apples from........ 212
Seed, Changing........ [illegible]
Seed, Diffusion of........ [illegible]
Seed, Forest Trees from........ [illegible]
Seed, Sweet Potato........ 487

Seedlings, Old Geraniums ... 549
Seeds, Time of Maturing of some ... 520
Seeds, Vitality of ... 282
Selection of Soil and Position ... 1
Sejour Beau, Guernsey ... 554
Seventeen-year Locusts ... 314
Shade Trees, Report on ... 456
Shading Bees ... 518
Shortening in Peach Trees ... 236
Show at Indianapolis, Winter ... 115
Shows, Agricultural, for 1854 ... 385
Shrubs, Flowering ... 146
Singular Tree ... 261
Sion House. Novelties at ... 477
Sleep of Leaves ... 278
Snails, to Destroy ... 296
Society, Agricultural Cayuga Co ... 147
Society, Agricultural Connecticut State ... 194
Society, Agricultural Franklin Co ... 194
Society, Agricultural U. S ... 47, 97, 146, 194
Society, Mobile Hort ... 48, 242
Society, Montgomery Agricultural ... 48
Society, Hort. Alton ... 48
Society, Hort. Brooklyn ... 292
Society, Hort. California ... 147
Society, Hort., Cin., Transactions of, 48, 99, 194, 242, 290, 338, 384
Society, Hort., Chester Co., ... 338
Society, Hort., Chunnenuggee, ... 292
Society, Hort., Columbus, ... 194
Society, Hort., Delaware Co., ... 338
Society, Hort., Kentucky, ... 242, 386
Society, Hort., Mass., ... 386, 525, 531
Societies, Hort., New, ... 95
Society, Hort., New Haven, ... 147
Society, Hort., New York, ... 147, 292, 338
Society, N. Y., Agricultural, ... 48
Society, Report to Penn., Hort., ... 24, 196
Society, Hort., Pittsburg, ... 194
Societies, Hort., suggestions, ... 533
Society, Hort., Worcester, ... 147
Society, Pomological, Amer., ... 242, 338, 446, 488
Society, Pomological, London, ... 532
Society, Pomological, O., ... 488
Society, Wisconsin State Agricultural, ... 48
Soda and Potash in Plants, ... 67
Soil, preparation of, ... 53
Soil, renovation of. Southern, ... 312
Soil, selection of and position, ... 1
Soil, Ventilation of, ... 329
Solar Heat, ... 209, 251, 300, 349, 389
Some Seeds, time of maturing of, ... 520
Song Birds. British, ... 218
Sources of Vegetable Matter, ... 408
Southern Apples, ... 95
Southern Grapes ... 59
Southern Soil, renovation of, ... 312
South, Horticulture in, ... 97
South, transplanting Trees in, ... 444
Special Manures for the Vine, ... 68
Species. Amer. Vitis, ... 81
Spring of 1854, ... 192
Spongicles of Roots, absorbent power of, ... 222
Stakes, Grapes and French Posts, ... 375
Standards of Vegetable excellence, ... 61
Storing Potatos, ... 532
State Agricultural Society, Conn., ... 194
State Board of Agriculture, Indiana, ... 99
State Board of Agricultnre, O., ... 48, 99
State Fairs, ... 97, 147, 435
State Fairs, Indiana, ... 147
State Fair, Iowa, ... 435
State Fair, Missouri, ... 48
St. Lawrence Apples, ... 96
Stock on Fruits. effects of the, ... 496
Stock Pears on Quince, ... 20, 218
Stone Fruit, disease of, ... 520
Strawberries, ... 18, 239
Strawberries, California, ... 64
Strawberry again, ... 287
Strawberries of Cincinnati, ... 286
Strawberry Question, ... 142, 186
Striking Cuttings in water, ... 263
Study, ... 552
Study of Nature ... 372
Substitute for Coffee, ... 427
Suckers, Chrysanthemums, ... 562
Sugar, ... 351, 404
Sugar Plants of California, ... 37
Suggestions, Hort. So., ... 533
Sulphur Cure, ... 40
Sulphur and the Grape disease, ... 285
Sumac, ... 376
Summer Climate, ... 198
Summer, Clim. of 1853, Agri. relations of, ... 156
Summer Fruits, ... 337
Summer, pruning the Orchard, ... 293
Summer, treatment, the Orchard, ... 245, 293
Superior, McAvoys, ... 8
Survey, Agricultural, of Ohio, ... 147
Survey, Geological, Iowa, ... 147
Survey of N. Y., Entomological, ... 472
Sweet Corn, ... 384
Sweet Potato Seed, ... 427
Tan, Potatoes grown in, ... 524
Tea, coloring green, ... 515
Tea Planting in Brazil, ... 509
Tea Tree, ... 85, 182
Temperature of Green Houses, ... 548
Tenn., Grape culture in, ... 311
Terra Cotta, ... 428
The Trees in Convention, ... 502
Timber, Growth of, ... 213
Thos. White Peach, Trellis of, ... 507
Time of Maturing of Some Seeds, ... 520
Tobacco, ... 281
To Botanists ... 85
To Correspondents ... 193
Town Roses, ... 317
Taste, Culture of Rural, ... 104
Training and Pruning Grape, ... 197
Transactions of Societies, ... 48, 99, 194, 242, 292, 338, 386
Transpiration, ... 300
Transplanting Trees in the South, ... 444
Transplanting of Trees, ... 407, 444
Treatment, the Orchard Summer, ... 245
Tree, Singular ... 261
Trees, Amer. Hand-book of ... 97
Trees, Distances for Planting ... 506
Trees, Forest ... 467
Trees, Forest from Seed, ... 220
Trees in Convention, ... 502
Trees Mammoth, Washingtonia gigantea ... 485
Trellis of Thomas White Peach, ... 507
Trees, Origin of Weeping ... 279
Trees, Plant ... 232
Trees, Peach shortening in, ... 236
Trees, Report on Shade ... 456
Trees, Scraping and Washing ... 254
Trees, Transplanting of ... 407, 444
Trenching the Garden, ... 14
Troup Hill Nurseries, ... 365
Tulips, ... 273
U. S. Agricultural Society, ... 47, 97, 146, 194
Use and abuse of Alcohol, ... 97
Uses of Knowledge ... 290
Utility of Fruits for Food and Preservation of Health, ... 417
Valuable Camellia, ... 518
Varieties House Grapes, ... 527
Varieties, the Humbug of Many ... 503
Vallies, Frosts of ... 277
Valley of Amazon, Exploration of ... 97
Value of Fruits, ... 532
Various Kinds of Sugar Considered, ... 351
Vegetables and Fruits, ... 17
Vegetables, Characteristics of Good ... 330
Vegetable Excellence, Standard of ... 61
Vegetable Growth, ... 479
Vegetable Matter, Sources of ... 408
Vegetation, Influence of Light on. 203, 248. 297, 345
Ventilation of the Soil, ... 329
Verbena, ... 366
Vine in Warm Countries, ... 463
Vine, Special Manure for ... 68
Visit to Louisville, ... 436
Vineyard, Grape and ... 1, 53, 101, 149, 197
Vineyard, Malaga Raisin ... 423
Vineyards of Northern California, ... 309
Vitality of Seeds, ... 282
Vitis, Amer. Species ... 81
Warm Countries, Grape in ... 463
Wash for Wooden Buildings, ... 530
Washing and Scraping Trees, ... 254
Washingtonia gigantea Mammoth Tree, ... 485
Waste Materials, ... 307
Water, Striking Cuttings in ... 263
Way to make Maclura Hedges, ... 116
Wax Grafting, ... 306

What is Manure,............................... 213
Wetherometer, Everybody's.................... 237
Weather, Prognostications of............... 98, 237
Weeping Trees, Origin of........ 279
Why do you plant an Orchard,................. 64
Where and How, Orchard........................ 151
Wood Paper,.. 284
Worcester Horticultural Society,................ 147
Word for the Ladies,.............................. 406
Work, Notices of this............................ 298
Wooden Buildidgs, Cheap Wash for............ 530
Wild Flowers for Garden,........................ 132
Wilder's Address,.................................. 437
Wine, Grapes for.................................. 404
Wine Growers Association, Transactions of. 48, 242, 292, 338, 386, 445
Winter Digging, the Garden...................... 14
Winter Exhibitions,................................ 96
Wintering Half-hardy Plants,.................... 549
Winter Meeting N. Y. Agricultural Society,...... 49
Winter Salads,...................................... 71
Winter Show at Indianapolis,.................... 115
Wisconsin Fruit Growers Convention,.......... 49
Wisconsin State Agricultural Society,.......... 48
Yield of Grapes,................................... 465
Young Gardeners, Mental Improvement of..... 552

THE

HORTICULTURAL REVIEW

AND

BOTANICAL MAGAZINE.

HORTICULTURE AND POMOLOGY.

The Grape—The Vineyard.

NO. I.—SELECTION OF SOIL AND POSITION.

In undertaking the Series of papers upon the Grape and the Vineyard, it is proposed to treat the topic systematically and deliberately. It must not be expected that a subject of so much importance can be served up at one meal—it must be divided into several parts, so that each may be treated in sufficient detail. In this way the several subdivisions may be successively presented in order, before the reader, and though each shall be rendered as complete as possible, it will require several months to elaborate the whole, and bring all of them fairly into notice. It is proposed in this, the first Number, to examine into the proper soils and positions for a Vineyard. The opinions that will be advanced are deduced from extended observation, frequent consultations with the most intelligent practical vignerons, and supported, in many instances, by the writings of those who may be assumed as the highest authorities in the culture of the Vine in the United States. As this branch of agriculture is pursued to a considerable extent, and with great success in this immediate neighborhood—the Illustrations will be drawn, to a great extent, from our own vineyards, but the writer will endeavor to collate also the experiences of those who have studied and pursued the vine-culture in other parts of the country—for we do not arrogate to ourselves to possess the only vine lands in our extended country—many spots may be found to be as well, or better adapted to the production of the luscious Grape and generous Wine.

The natural region of the grape-vine of our country, in its several species and varieties, is very extended; we find the wild vines growing as far north as lat. 45°, and extending into Texas on the south. The Hill grapes and Chicken grapes, *Vitis æstivalis*, abound upon the gravelly ridges of the middle States; while the Fox grape is found in flat lands and near water-courses, in many parts of the same geographical range, and extending into New England, which has latterly become almost as famous for the *Charter grape*, which is of this class, as one of the cities of Connecticut is for the Charter oak, whose cavity, now secured with padlock and iron door, was once the depositary of invaluable documents. The varieties of the Fox grape, *Vitis labrusca*, prevail over a wide extent of territory, covering the central portion of the Union, from the lakes on the north, to the Tennessee river on the south.

In this same region, wherever the river bottoms and adjacent hills are composed of a rich soil, we find, very generally distributed, a luxuriant vine, sometimes of enormous size, on our western streams, where may be seen stems one foot in diameter, swinging, suspended from the tops of forest trees one

hundred feet high. This is the variety known as the River grape or Frost grape, *Vitis riparia;* the fruit is very small and too tart and austere for the table, but its presence has, by most authors, been assumed a good indication, of a favorable location for a Vineyard—this assumption, however, although supported by the authority of Michaux, himself, has not always proved to be a safe guide.

The elements for the production of an immense growth of wood are certainly present in these soils; but, as their appropriations to the culture of superior varieties of the vine have not always been attended with success, it may be inferred that the conditions requisite for the production of choice fruit have not existed. Still, it must be confessed that the natural growth of wild grapes may be taken as an index of considerable value, due reference being had to the exposure and elevation of the spot selected.

In a range south of the region just alluded to, beside the varieties of the species already mentioned, we find a new class of vines presenting themselves. In North Carolina, the source of the celebrated Catawba, and where perhaps several of the better sorts of the Fox grape, or those nearly allied to it grow, the Scuppernongs and Muscadines, also, make their appearance, and constitute the chief representatives of this genus in that range of latitude, and extend to the Gulf of Mexico. In Arkansas, which is very fruitful in climbers, the grapes abound in almost all situations—the Muscadine varieties being most common on the sandy soils, and the better kinds on the rolling swells south and east of the range of Masserne Mountains; among the latter several have been discovered which bear a strong resemblance to the Catawba. In Texas new varieties are discovered, some of which may have great merit, but nothing very superior has yet been brought into notice.

Looking abroad, we find that the soils of the Grape countries of the world are equally various. In these, however, one striking feature may be observed, quite different from the natural conditions of our own land; there the original production of grapes was limited, and embraced very few sorts, while the distinct species and varieties in this country, as described by some botanists, are exceedingly numerous. The great number of varieties cultivated in Europe are either those that have been introduced from other lands, or produced from seed—new individuals, but not true natives. In Spain, the soils are described as being flinty, and frequently volcanic or granitic. In France, we find an equal diversity in the character of the land planted with grapes; but generally speaking, that which is rich and level is not valued so highly for producing wines of high character, although the quantity is sometimes enormous. There we find gravelly, chalky, clayey, rocky and sandy soils, levels, and ridges, and steep terraced hill-sides, all in turn appropriated to the culture of the luscious grape and flowing wine. In Italy, the limestones of the Sub-Apennines as well as the Scoria hills, and the lava rocks of ancient volcanos, and the gravelly detritus of the Alpine streams, all yield their surface to the culture of this crop. In the islands of Madeira, the clefts of the volcanic mountains, filled with the decayed materials which in centuries have smoldered from their craggy sides, furnish a refuge which has hitherto been congenial to the roots of some of the most delicate varieties of grape, now suffering under the *maladie*, after they have obtained a wide celebrity in their products. In the northern parts of France, and in Germany, the banks of the Rhine and the adjacent regions, with their Musselkalk rocks, have been quarried out and built up in terraces to support the fruitful vine, which here approaches its northern limit; but which submits to severer rigors and a stiffer soil in the damp climate of Hungary, where the snow often interferes with the vintage.

The reader must not hence infer that any soil, and any situation will answer for the culture of the grape, although it appears, from this hasty glance, that the cultivation is extended over many kinds of rocks, with their peculiar soils. One axiom may be advanced—the mineral constituents of every plant, must pre-exist in the earth that has produced it; hence, those soils which contain a good share of the elements of any plant, and in a proper state of disintegration, will,

cæteris paribus, be found to be the best adapted to the production of that plant; now the analysis of the Grape-vine and of its fruit, demonstrates the existence of a large proportion of *potash*—granitic and volcanic soils furnish this material, and may be assumed as the most favorable for the vine—this assumption is supported by observation. But in the preparation of the surface of the earth, immense attrition, denudation and transport of the different rocks have occurred, resulting in a happy variety of the several ingredients, more or less thoroughly mixed in most soils. In this portion of our own country, we do not find a very large proportion of this very valuable and important ingredient; hence, the *à priori* conclusion respecting the culture of the grape, would have been adverse to its introduction; but we find a sufficiency of the necessary potassa to furnish luxuriant growth and well ripened fruit, and we have intelligence enough to add successive supplies, as a special manure, when we shall find a deficiency indicated by failing crops—this application has already been made to some vineyards with happy results, as will be shown in a future number.

Soil and Position.—Some diversity of opinion exists among those who plant the vine, as to the most favorable exposure—each has his peculiar notions, often founded upon preconceived views brought from a distant country, not similarly situated, and with a different climatic constitution from our own, or drawn from the dogmas and experiences of writers and planters in other lands. From these various views, preconceived and practical, I shall endeavor to deduce some data, which are the results of a very extended series of observations made in hundreds of localities, with every variety of exposure.

Low lands, river bottoms and valleys, should generally be avoided, as unsuited, on many accounts, for the grape culture; chiefly for the following reasons: they are very subject to late vernal frosts, which are often disastrous to the tender young shoots of the vine; they are also obnoxious to early frosts in the autumn, unless where protected by fogs; they do not enjoy so free a circulation of air as is desirable for the vine; the soil is apt to be too rich in vegetable matter, and, if not underlaid by gravel, the subjacent moisture will be injurious. The early vine-planters at Vevay, Indiana, committed this mistake, and were soon driven to the hill sides, or discouraged, and relinquished the culture to such an extent that the products of that whole region is now quite insignificant.

Hill sides are generally preferred, and the majority select those with a southern exposure—those sloping eastwardly to meet the early sunshine, and those with a western declivity, to receive the health-giving zephyrs, are also much preferred by some close observers, who claim, for either circumstance, quite as much value as for the full meridian rays of our summer sun, while others, consider a northern slope still more advantageous, because of the greater immunity from the spring frosts, where the buds are not forced so early as in more sunny situations. These Hill sides are generally so precipitous as to render benching or terracing necessary, and where the horizontal layers of limestone are freely mixed with the soil, these stones are used for the construction of walls, to support the earth of the terraces; when absent, the benches are constructed of the turf or sods, and they are preserved by the growth of the grass. The presence of small loose stones is much valued by some vignerons.

Hill tops, on account of their elevation and free exposure to sun, and especially to the stirring breeze, are, in my opinion, decidedly the best positions for the vineyard. Here we have much less liability to vernal frosts—perfect exposure to the sun and air, for the dissipation of too abundant moisture, and an almost complete immunity from fogs, which may be very valuable to protect the deeper valleys from a late frost, but which are exceedingly injurious to the swelling grape, in the heats of June, the most critical period with this fruit. Upon these hill tops we often find an abundant natural drainage, and a soil of peculiar excellence and adaptation to the vine—a deep, rich, sandy or friable loam, with clay enough in its composition to give it a proper tenacity, but not enough to render it heavy,—and indicating a richly

varied list of constituents—in such a soil, found especially upon the ridges of our river hills, there is a smaller proportion of lime, and a large amount of organic matter; in this the grape is found to flourish remarkably.

I shall, therefore, conclude this Number by recommending an elevated position, well exposed to both sun and wind, and a rich, friable soil, of varied ingredients, rather than the stiff limestone clays of the hill sides.

J. A. W.

McAvoy's Superior.

Although still a novelty, this remarkable fruit has made no little noise in the world. It is well known and highly appreciated in its native locality, but has met with various treatment abroad. As it has received a very high premium from a prominent Horticultural Society, it must have been supposed to be possessed of great merit; hence, amateurs and nurserymen, all over the country, have striven to possess themselves of plants of this famous variety, and among the reports from those who have fruited this sort during the past season, it is surprising that there should be remarkable discrepancies; even where plates are given, they are not always portraits. This state of affairs, it is thought, can only have arisen from the unfortunate accidental distribution of impure or mixed plants—this is exceedingly annoying, since unpleasant reflections will unavoidably be thrown out, to the discredit of the parties concerned in the distribution of the plants. In their behalf I beg to say a word—though not intending any justification of errors which might have been avoided.

Every nurseryman, and every intelligent amateur is well aware of the extreme difficulty experienced by those who cultivate many sorts of the Strawberry, in keeping them all distinct; add to this the great general similarity of the foliage, and we may perceive the greater difficulty of learning each, so as to distinguish it from a mixed mass of different varieties. Nothing short of a continued study of the very many sorts cultivated experimentally by the amateurs, or grown for sale by the nurserymen, to supply the demands of the first named class—nothing, I say, short of continued study will enable any man of common ability to distinguish the varieties; nor will anything short of constant watchfulness enable any one to keep each, distinct from mixture—in this all will agree.

In previous papers upon the Strawberry culture, it has been recommended, in selecting staminate plants as fertilizers, to choose them especially with regard to their time of flowering, and peculiarity of foliage, compared to the pistillate sorts with which they are to be planted, so that the inflorescence may be coincident, and the runners be readily distinguished, when out of place; these points being of more value than the fruit they may produce: if a good berry have been secured with the other qualifications, so much the better. I am unwilling to believe that any of the parties who have distributed our celebrated seedlings, for we have many that have attracted deserved attention, could have sent spurious sorts *willfully*, but I am well aware that many persons here, as elsewhere, do not accurately observe the nice distinctive characters; this is especially true of the amateur cultivators, for those who are engaged in a business requiring a close study of nice distinctions in flowers and foliage, cannot fail soon to learn the peculiarities of each. That spurious sorts have gone out, however, there can be no doubt; they have been detected again and again, and the descriptions of fruits do not correspond with the characters of the varieties to which they are assigned: but this is no new complaint—we have here received plants under erroneous titles in very many instances from our good friends in the east.

With these apologetic remarks, as a prologue, let us proceed with a brief history and description of the Superior; they are presented with the frontispiece, as a letter of introduction to the reader, to whom, a more intimate acquaintance with the fruit, is earnestly recommended.

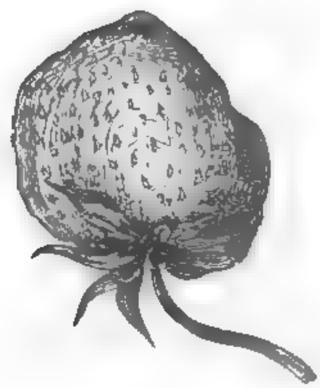
In the year 1846, D. McAvoy, then occupying a portion of Mr. Longworth's Garden of Eden, near this city, selected four quarts of fine berries of the *Necked Pine*, *Hudson*, *Hovey*, and a choice variety known here as *Pistillate Keen*, all favorite kinds, known in

this neighborhood as pistillates; they had been impregnated by the *Iowa* and *Swainstone* sorts. These berries were mashed, and at once sown in a suitable place; some vegetated very soon, and others continued to appear until the next season; they were successively pricked out into good soil, and their growth encouraged. The plants resulting from this sowing, were estimated at 500,000, and were distributed among the neighbors, where they met with more or less care, according to the tastes and industry of the gardeners; many were planted among the grapes of a young vineyard—others in garden borders.

The most promising plants were selected and marked whenever observed, but the most critical attention and study were bestowed in the Spring of 1848, when they were two years old, from the seed. A committee of the Horticultural Society, then carefully watched them from the flower to the fruit, and selected as note-worthy, about fifty, from this immense collection, rejecting entirely, a large number which were so largely staminate as to be poor bearers. Those selected and marked, the first year, were carefully removed to favorable situations, and well cared for, so that they spread by runners, and presented groups for the examination which was repeated next season, (1849) when the closest scrutiny was exercised, and all striking peculiarities were noted. The same care was extended toward them by the committee who had the subject in hand, in 1850, and it was during this year, that the Horticultural Society had its attention particularly directed to a few of the most remarkable of these seedlings; some amateurs were cultivating them, and comparing their flavor and appearance with the best varieties in cultivation.

In the next year, the Fruit Committee reported very favorably, as the seedlings, in that disastrous season, appeared much better than the old sorts, and in May, 1851, the Society's premium of $100, was awarded to that one of these seedlings which had been known as No. 12, but which was then christened SUPERIOR, or *McAvoy's Superior*. From this time, its progress, in public favor, has been upward and onward, wherever it has been known, and that is, wherever it has been received true to name; so that it is now the decided favorite with a large proportion of those who are interested in the culture of this delicious variety of fruit. Its hardiness, great productiveness, large size, good flavor, and luscious richness, have secured to it many admirers, and it will rank high as a market fruit.

Description.—Plant vigorous on clayey soils; leaves well developed, supported by stout petioles; pubescence considerable, inclining downward; leaflets all petiolate, oblong, and obliquely cuneate at the base; length about twice the breadth; surface rather shining; not much plaited; uneven from the waving margin, which is acutely serrate; the serratures acuminate; color rich green, glaucous beneath; stipules large, purplish; truss of inflorescence, rather bold and upright; scape bearing from six to ten flowers, which are of medium size, and entirely destitute of stamens, except the rudimentary undeveloped organs, concealed beneath the large *torus* of pistils. The fruit is clasped by the coarse segments of the calyx; it is large, ovate, somewhat irregular in shape, being sometimes slightly necked, as represented in the cut; color, externally, a



rich, deep crimson; internally, a shaded red salmon; seeds rather superficial, yellow, and sometimes red; flavor, when ripe, sweet and very luscious, more rich and piquant than Hovey's Seedling, but less acid than the Scarlets; perfume high.

The runners of this plant are a good and marked character; they are long-jointed, and remarkably red, and so vigorous that the variety is rapidly propagated.

That it has given satisfaction to others than Western cultivators, will appear by the following quotation from R. G. PARDEE, one of the most observing amateurs, who contributes intelligently and agreeably to the strawberry literature of the country, through the Horticulturist:—"We had large expectations of this new variety, and have not been disappointed. It has this season, been superior to any of the fifty varieties bearing on my grounds, and beside, I have seen it bearing in several other gardens, on Long Island, Newburgh, and in this vicinity; and in all places where I have seen it, it has, as far as one season's trial can do it, proved number one in size, flavor, and productiveness. Some question has arisen about its being of sufficiently high flavor to meet its reputation, and the taste of imperfectly ripened specimens at several exhibitions, has given some reason for this objection; yet, after repeated and careful examinations of it, in various gardens and locations, in company with some whose taste is intelligent, we think it of high rich flavor."

Mr. PARDEE so highly esteems this variety that he has selected it as one of three from which to raise seedlings. Mr. BARRY, in the Horticulturist, says his specimens were scarcely equal to those of Mr. PARDEE, but he considers it a prolific, good variety, not of first rate flavor; he then quotes Mr. HOVEY, as saying, "It is the best-flavored of the four (Cincinnati seedlings) but far inferior to many of the older varieties," and adds that at Pittsburgh it has proved almost a failure, in every case where it has been tested. This last remark may be explained; in the hands of Mr. CHISLETT, at the Alleghany Cemetery, it is genuine, and doing very well; perhaps others have a spurious kind, or their plants were not yet established. It is believed they were not purchased at first hands.

A writer in the *Farm Journal*, evinces his good taste and judgment, and shows that he has the true variety, by the following expression: "Fruit very large, roundish ovate, occasionally slightly necked; deep brilliant crimson; seed crimson, sometimes yellow; set-in indentations that are not deep, except in the largest specimens; flesh red; flavor exquisitely fine; quality "best."

He then quotes Dr. BRINCKLE, who is admitted as the highest authority, and who is known to have received his plants correctly, from head quarters: "Taking all its qualities into consideration, it is probably the most valuable strawberry we have." And adds, on the authority of WM. PARRY, "A practical strawberry grower of New Jersey, who cultivates many varieties, '*McAvoy's Superior yielded a larger crop of large-sized berries than any other.*'" J. A. W.

Horticultural Novelties.

DOCTOR FRANKLIN, or some one else, has said a good thing of the man who discovers how to make two blades of grass to grow, where but one grew before. The laws of the land, recognizing the benefits conferred upon the world by the invention or discovery of new processes or combinations in the mechanic arts, give to the man who has done it, a right of property in the thing invented, as a reward. So too, in that department of human industry which pertains particularly to the cultivation of the soil, the world has become credulous even to the claims of new inventors, and the man who by new methods has succeeded in improving the old stock—no matter what it is—or who by continued experiment and close observation has established his claim as an inventor, so to speak—a producer of some new and valuable variety, finds himself, in a majority of cases, amply rewarded. He has the means for this in his own hands. In benefiting the world he has conferred a benefit upon himself as well—coming to him not unfrequently in the shape of a golden harvest when judiciously and carefully managed.

Indeed, so certainly has this come to be relied upon, especially in the production of new plants, grains, flowers and fruits, that the whole subject of *horticultural novelties*, has become one of no little importance both to the amateur and the professional cultivator. Every day almost, brings a score of

new claimants to our attention, and of course, therefore, new demands upon our purses. If these demands were responded to only by those purses of plethoric habit, so long as it remained an experiment, and we who carried the *lean* ones, or none at all, could content ourselves to wait the result which would come from that experiment—the *wrong* would perhaps be as great, but would be less generally felt of course. But to submit one of these *novelties* to the test of experiment requires time. To our impatience—especially when stimulated by energy and enterprise—the hope of gain, or of some selfish gratification, the seasons in their courses and the great processes of Nature, by which her floral and fruitful gifts are so bountifully and so quickly produced, seem but slow and uncertain.

To wait for the result of another man's experiment is to fail in the contest for which we have entered. Success, we know full-well, has come to be regarded as the standard of merit.

Our impatience begets credulity, and our wish at once glides into conviction and belief. And even when failure has been written on all we have done, we find good excuses for the blunders we have made in impugning others.

A reputable man presents his claim to us, asserting that *he* has done all which *we* could do, to test the value of his new variety. He sets forth its character and consequent value in detail, and we have either to accept the statement to which every impulse of our nature prompts us, or, against evidence,—disbelieve it.

In our communings with Nature, while pursuing an avocation whose success is so dependent upon her favor, we ought to have imbibed something of her spirit, which is all truthfulness and all generosity, and if we have—yielding all the more easily to a desire of possessing some new evidence of her inexhaustible wealth. We accept the statement which is made and pay a willing tribute to the supposed genius and industry, and patience, and scientific skill, by which the new thing—whatever it may be—has been created for our enjoyment. Alas! that human hopes should fade so frequently with their birth, and that reliance upon human character should so often prove but a broken reed.

If you have been in the habit frequently of indulging the desire for these novelties, and in the excitement to which it leads, you have sometimes, without doubt, been rewarded for all you have expended and all you have done, and yet how often and with what disappointment have you found yourself the victim of your own credulity and another man's avarice.

The new grape, on whose luscious clusters you were already in imagination feasting, proves to be, after all, but a discarded or worthless variety. The blushing apple, which was promised to supply your table at a time when, even if of indifferent quality, it would be a luxury, has decayed long before its old and reliable companions of the fruit room. In your anxiety to get some new pear, better than any of the five hundred and more whose names appear on the catalogues, you find, after years of careful and generous culture that your grounds are cumbered with a tree, which ought never to have been lifted from the seed bed, except as a stock for some old favorite bud infinitely better than itself. And the new rose whose unrivaled hue and ambrosial fragrance and prolific growth, were to be sources of perpetual gratification to your delighted senses, droops and dies with the chilling frosts of your northern winter, leaving the entrance to your house and heart covered and filled with the dead brush of a blasted plant, and with disappointed hopes. And so it is to the end. We demand and are willing to pay for *new things* and we get them—*real* ones occasionally—*shams* generally,—for, I grieve to say it, honesty is a plant easily choked in the human heart by the weeds of avarice—the love of money and the hope of gain. The world is full of men, ready to swear that a sham is a reality, and that truth and pretense are but synonyms for the first of virtues.

Enterprise and industry, when honestly directed, are worthy of all commendation and are fully entitled to the reward they are quite sure of receiving; but when the truth by which they lay claim to our attention,

culminates in a lying advertisement or some other and more positive deception, they become vices so naked and unscrupulous that good men should frown upon and reprove those who are guilty of practicing them.

The Horticultural world has been victimized from time immemorial by these villainous deceptions—and the end is not yet. Success has emboldened old offenders and encouraged new ones, until self respect and personal, as well as professional reputation, is but too frequently bartered away for the poor reward of a little pecuniary gain.

The language used by the writer is for the express purpose of conveying his thought upon the general subject and nothing more. He has no desire of dragging before the public, the names of either the first or the last of those, who, filling his mind, he has grouped together as a class of unprincipled, and of course, therefore, dishonorable and dishonest men.

The remedy for the evil of which I have spoken must be found in greater watchfulness on the part of the public, and in holding to a strict accountability the authors of these deceptions. The man who deliberately makes up his mind to put his personal honor and professional reputation, if he have any capital of this kind, at stake, in order that he may introduce his new humbug with profit,—which with him is the measure of success—must be made to lose the game and pay the forfeit.

And in many cases it would be a most effectual remedy, if he could be made to respond also in pecuniary damages for the misrepresentations and failures with which he is so frequently chargeable.

The purse strings of such men are not unfrequently the *tendons Achilles*, by which they can most surely be vanquished, and society is rid of a pest when the work is once well done.

My language, as will at once be perceived, has no application except to the pretender, who with brazen impudence offers to the world as new and valuable something which he knows to be different from what he represents it. The statement of such a bare-faced and villainous proposition as even an existing fact, will hardly be credited by those who have not had their attention drawn to the subject, and such will be disposed to think, I am battling against the air. And yet we know it is true, and that many a man suffers in silence rather than admit that he, too has been duped and cheated.

For the honest experimenter, who with laudable ambition, whether stimulated by benevolence or self interest, is seeking to improve the old, or discover that which is better in the new, I have profound respect. Horticulture, like every other department of human industry, is indebted to just such men for its advances. That they may reap the reward to which they are entitled and that others may be thereby stimulated to still further effort, there should go up from honest men, a united and universal denunciation of all humbugs and all pretenders. *

Remarks.—This article, from a valued correspondent, who evidently considers himself, in some private way aggrieved, is admitted into our columns, simply because such complaints, when well founded, are entitled to be heard. We wish, however, to be understood, as taking sides with neither of the parties. We have no knowledge of the specialities of the writer's strictures.—Eds. Rev.

Lime on Fruit Trees.

I have spoken of Lime as a specific highly deserving of further trial, rather than as an infallible remedy against the ravages of the curculio. It is true that for the years 1848 and 1849, its efficacy seemed undoubted, but a train of favorable conditions in those seasons may have existed during the application of the liming, which, acting in concert therewith, may have lessened the difficulty of protection, while in other years the absence of those favorable conditions will increase the work of preservation beyond the power of any agency which Lime can exert.

Repeated experiments are needed to settle the exact value of this application. After the use of it for three consecutive seasons, I verily believe in the virtue of lime to protect the plum, apricot, and nectarine from the assaults of the curculio from the time the fruits are large enough to be pierced until

they are six weeks old, and that such protection will in many seasons insure the maturity of the crop; but last year's experience has taught us that this short exemption is not always perfect security, while no attempted experiment enables one to say what effect a continuation of the liming without interruption beyond six weeks, would exert in such a case. But, notwithstanding all the difficulties of last season, lime-treated apricots ripened well, as did a large portion of the plum crop and some nectarines. Indeed, so obvious was the effect of lime on these latter fruits, that, at the close of the liming season, when every fruit was sound and perfect on the dusted trees, certain other nectarine trees, left to themselves, had cast their fruit upon the ground, or they remained on the branches shriveled and dry as we sometimes see them in winter.

The theory of using lime for the annoyance of insects is not a new one, but is to be found in the books, and especially in London. It is only in the mode of application that my practice has any claim to originality. If, however, I am to be held responsible for the paternity of even this slight innovation, I must then be allowed to state that the use of lime-water is entirely inadmissible, save where one is curious to mature a few individual fruits too scattering to be dusted, and is willing to apply the wash with a brush. Gravity and the affinity of particles of water for each other make it impossible to cover the glass-like surface of the young fruits by syringing with lime-water; but after the fruits and leaves have been profusely syringed with pure water, and the powder thrown upward through the branches, until the whole is enveloped in a cloud, the fruits will become covered on all sides.

At this point, a question springs up as to how far this liming may extend without exerting an injurious influence upon the general thrift and health of the tree. Without any attempt to settle a question at once both difficult and new, I think it may be said that my individual practice tends to sustain a belief that so much lime as would be required to dust the trees every five or eight days during May and early June will, if administered, prove beneficial rather than hurtful, as is indicated by the following experiments:

Within a few years, the *chermes pyri* (of Kollar) has made its appearance in my pear orchard, and in such numbers that on some trees the young branches and leaves seemed as filthy and black as if coated with lamp-black.

Several such trees, during the last season, were well syringed and afterward dusted with lime, until the whole system of leaves and branches was whitened—when the lime, thrown upon this black excrementitious matter which had been moistened in syringing, united therewith, incrusting both leaves and branches. This incrustation afterward scaling off under the action of wind and rain, removed from the surface of the leaves and branches all impurities, just as soap or lime is known to cleanse the stem. Easter Beurre and White Doyenne pear trees, twice treated with lime in this manner during the last season, acquired thereby the usual glossy green hue upon their leaves, and, what is more, the insects being destroyed and the trees relieved from this exhausting drain of their fluids of circulation, many branches made new and vigorous growth.

I have also applied lime with marked success for the destruction of the *scale insect* upon the orange tribe, generally, however, resorting to its use in the fall or winter when the plants were at rest. But, in the summer of 1850, an orange tree, growing in the open air, was assailed by cocci in such numbers that the branches and leaves were literally covered.

After syringing this tree well, and taking hold of the branches with one hand, lime from a dredging box was so applied with the other as to envelop entirely, stem, branches, and leaves; making the whole resemble more a tree in plaster, cast in "*alto relievo*," than the appearance of a living plant. After a short time, buds burst forth from the surface, and the whole white mass was covered with green branches long before the lime incrustations enveloping the leaves had burst and fallen. When, however, the leaves were set free they seemed to have lost nothing of due vigor or a proper color. Indeed, in the plum crop itself, so perfectly free from gum

are the leaves and fruits upon some trees successfully treated with this application that I am much inclined to consider their peculiar exemption an effect which has in some degree a corresponding connection with lime as a cause.

How the result is brought about does not appear, and, among other speculations explanatory of the modus operandi, I have indulged in the following as at least plausible if not true: First, lime thus applied removes all impurities from the surfaces of fruits and leaves, thus securing a free and healthful perspiration. Again, lime in the state of an impalpable powder (and it is unfit for use when in throwing it against the leaves the slightest rattling is heard) almost floats in the air—being so porous or so laminate as to be many times lighter than the unslaked mass, so that the white envelope inclosing the leaves and fruits really is what it seems to be when examined by the microscope, a white covering of open work, absorbing by virtue of its color all the luminous rays of the sunbeams, and transmitting in subdued intensity rather than excluding them; while the same white color to some extent screens the whole from the scorching effects of an intemperate noonday sun, by reflecting instead of absorbing the thermanous ray of the same sunbeam, just as it is supposed that, in some locations, pressed glass, by subduing the intensity of light and heat, promotes the health of the vine. Hoping to hear a good account from your rather extensive orchard of plums,

I remain, very respectfully, yours,

L. Young.

Springdale, Ky.

The Garden.

TRENCHING — WINTER DIGGING.

In this Series of articles, different topics will be taken up in succession, as they appear to be most seasonable, and as they may be suggested by passing events, or the pressing wants of the reader. As a thorough preparation of the soil is a matter of primary importance, I have determined to commence with this subject.

Wheresoever and howsoever the garden may be situated, whatever its aspect and soil, it is most desirable to have the earth loosened, and, indeed, thoroughly turned over in the fall and winter, in order that the frosts of the latter season may have an opportunity of aiding in the great work of pulverization, so that the material may also be in the best condition to absorb and store away for the coming crops, the ammonia brought by the gentle showers, and the still more gently falling snow, with its richer freight of this invaluable vegetable food.

So soon as the crops are removed, in the autumn, this process may be commenced, and it may be continued throughout the winter, whenever the icy bonds of the frost king do not interpose a resisting barrier—a crust of frozen earth will interpose but a slight resistance to the pick and the spade, and will, in the process of overturning the soil, make the benefit of frost more general through the mass, since the expanded frozen portion, will occupy less space when it thaws, and allow a better entrance to the air.

All digging, but more especially all winter digging, should be done rather roughly—the complete, elegant appearance of the work—left by your accomplished digger, who may slight his performance, by shallow stirring of the soil, but who will spend much time in comminuting the surface, and rendering it very fine and very smooth, is not at all what is desired, especially in this winter operation—rather give us a rough-looking surface, the clods scarcely broken, the frost will mellow them, sufficiently, and indeed, with such a surface it has an increased opportunity to do its invaluable share of the work, while the portion thus exposed for absorbing the atmospheric riches is also greatly increased.

The importance of thoroughly draining the soil cannot be too forcibly impressed upon the minds of those who would properly prepare a piece of ground appropriated to a garden. This matter has been frequently presented to the readers of the previous volumes, and in many publications has been reiterated, and substantiated by powerful arguments, deduced from successful practice, and hence, need not, in this article, be further extended. Draining the ground, as a primary

operation, conducive to the best results in the garden, the vineyard, the nursery and the orchard, as well as the more extended fields of corn and wheat in which the farmer takes a just pride, will again be presented, and its claims to consideration will be urged at a future period.

That digging may be of the greatest advantage, it should be well performed; the spade or fork, whichever be used, should be driven deeply into the soil, the portions taken up each time should not be too large, and little attention should be paid to breaking it up finely; but it will be of great consequence, in throwing down the spit, that the original position be reversed, so that the earth may be turned upside down.

A great improvement upon common digging may be effected by keeping the furrow or trench open, and then working up the subsoil with the spade, fork, or even with a pick or mattock, especially if this part be compact and solid; and, if there be a crust or indurated layer called a *hard-pan* this process will be of great value to the crops of the next and ensuing seasons. Ridging the soil, even in common digging, is of advantage by exposing a greater surface to the action of the atmospheric influences—this is done by digging in strips three or four spade's widths, and throwing the earth from the right and left upon the middle portion of the land.

Trenching the soil is a still more efficacious operation, inasmuch as by it the earth is stirred and more or less mixed to a still greater depth. This process has some modifications which I shall endeavor to explain to the reader. Simple trenching consists of twice digging the soil, or stirring it two spades deep, leaving the two layers of earth in their natural position, or reversing them. In the first place an opening is made across one side of the space to be dug, the surface soil is dug out to the width of about two or three feet, from which all the surface earth, removed by the first spit, is thrown aside and left, to be used at the last. One-half of the subsoil, or second spit, is then thrown out by itself, and the remainder is dug up and deposited in the deep ditch or trench last opened—the workmen then proceed to dig the next strip of the surface soil; after having marked off with a line and cut with the spade, the necessary width, it is thrown over across the open trench in the subsoil, and upon that portion of the subsoil that is dug—the subsoil of this second strip is then dug up and thrown into the trench beside it, leaving in turn another cavity, across which the next row or slice of surface soil is thrown, and so on to the end—when this is reached the first subsoil that was removed is wheeled or carted round from the place of beginning, and then the first surface soil is brought and spread over it, so that there is no trench left.

Where the object of trenching is to reverse the two layers of soil, the mode of procedure is somewhat similar, but more simple—the trench is first opened as before but the soil is all removed to the depth of two spades and thrown aside—the second strip is then marked off, and the surface soil is thrown into the bottom of the trench, after which the subsoil is lifted and thrown upon that just dug. In all these operations one man can perform the work alone, but several may labor together to advantage, and as some portions of the digging require more skill and greater effort, these may be assigned to the better workmen, or the operatives may change positions. It will not be absolutely necessary to mark off the lands, but this plan has advantages which are worthy of consideration. The work will be more perfectly done, the surface will be left more even and regular, and the end of the process will present a regular appearance.

A still more thorough method of trenching is performed by digging three spits deep—the process is only an extension or modification of that just described—somewhat more intricate in its description, however, but which may be adopted by any one who understands the former method. This triple trenching is applicable to soils of great depth which will allow of turning the surface soil to the bottom, and to soils in which the subsoil is not too crude and unfit for plants at the surface. In the culture of grapes and other deep-rooted plants, this thorough tillage will possess advantages, but for common garden plants the surface soil should be retained near the tender roots of the young seedlings,

which might suffer for want of nourishment, in the unkind soil from below, unless it have been manured and well aerated by exposure during the winter. The same remarks will apply to common trenching of two spits deep, which often brings up a stiff clayey soil unfit for delicate plants, before they have time to penetrate to the better soil below.

One of the great and immediate advantages of trenching, next to the melioration of the soil, is the destruction of weeds, by burying their seeds deeply, beyond the influence of heat and light; this spares the gardener much labor in tending his crops; but the two greatest inducements to perform this labor, are the deep tillage, which prevents, in a remarkable degree, the influence of drought, and the happy effect of turning up a new portion of soil to receive the meliorating influence of sunshine and shower, frost and dew, by which a cloddy, yellow, cold subsoil, becomes rapidly changed into a rich brown friable soil, often rivaling the original surface mold in productiveness.

A modification of this mode of digging in wide lands, will suggest itself to those who object to carting the dirt first removed to the end of work, to fill up the last trench. This consists in laying off the ground into strips of three or four feet in width, opening a trench across this narrow land, throwing aside the dirt as before; when the end of the portion marked off has been reached, the open trench is occupied by the earth, to be removed from the first trench of the next land, and so on to the end. Each land in this plan begins by closing that just dug, and the last is, in turn, finished by removing the small quantity thrown out at the commencement of the first.

Mr. NICOL has adopted a combination of these modes of trenching, to be employed through a series of years. He trenches three spit deep, turning the surface soil into the bottom, the middle portion remaining in place, while the other two layers are reversed; after taking three crops from this surface, he trenches two spits deep, bringing the middle to the surface; this is cropped three years, when a trenching of three spits, brings the middle soil to the bottom, and restores the original surface to the top, after a rest of six years—he thus continually changes the surface, each portion resting six, and producing, in turn, for three years.

Some of my readers may suppose, that this laborious method of digging their soils, will not pay in this country—they may rest assured that it will reward them for their trouble and expense by increased crops, and by enabling their vegetables to withstand the droughts of our summers—of this there can be no doubt, as we may find cumulative testimony in the experience of every gardener; the excellent effects of thorough trenching were remarkably apparent during the last two trying seasons—while most crops were suffering dreadfully, for want of moisture, those on trenched ground continued to grow and thrive without a day's intermission, and the soil was found to be mellow, and damp, wherever stirred, instead of being baked and cracked, and utterly dry.

Those who cannot be persuaded to perform this operation, or who have not the labor at command to perform the work aright, are urged to adopt the next best process, as a substitute. Let the plow, and the subsoil plow be brought into requisition, though these be poor substitutes for the trenching, spade, and fork, and much better adapted to the field, than to the garden, still, by their means much good may be effected. Let the large plow with heavy team do its work of reversal—after the deep-running subsoil plow has done its part, stirring up the stiff clay bottom, let the turning plow come back, throwing the first furrow-slice into its original position, to be again followed by the subsoil—gathering with narrow furrow-slices, that the earth may be rather set on edge than turned over; the whole surface may be stirred with these two implements, to a depth of twenty inches or more, and thrown up into steep and narrow *ridges*, and thus finely exposed to the frost and sun.

The destruction of insects is one great good effected by these winter operations upon the soil. A service of inestimable value to the future crops, is thus performed at a season when we have most leisure, and to those readers who have tender sympathies, whether for the bugs themselves, or for their plants, it will be some consolation, that now they will

not be called upon to witness the sufferings of either — while in a dormant state, the larvæ of many of these pests of the garden, are quietly extinguished by the relentless grasp of the frost-king, while others are appropriated to satisfy the cravings of the feathered tribes—another result, perhaps not less harrowing to the sentimentalist, occurs to the larvals known as *cut-worms*, the dread of gardeners, on account of their voracious appetites among the early products of the spring; these low-lived creatures are so insensible to cold, that the frost cannot affect them, through their tough and dusky integuments—but the miserable gourmands, instead of being allowed to riot through the winter, upon the vegetables and weeds that may survive the frost, are now deprived of their sustenance, and die a wretched death by starvation—shudder not, kind friend—better they, by even such a death, than thy cabbages and floral pets, by their devouring jaws, next Spring!

Fall and winter digging and plowing, are the best preventives of *cut-worms*.

J. A. W.

Letter from Astoria.

Dr. Warder—Dear Sir:

The Review is now a regular visitor at my Bachelor home, in this far off land; and I hail it with a hearty welcome. It comes like a ministering angel, bearing wholesome food to the mind; and although it does not bring the sparkling juice itself, nor luscious fruit, nor fragrant flowers; yet it arouses pleasant recollections of them, and incites me to a more vigorous effort, again to procure those luxuries.

I find it an excellent companion; it enlivens my leisure hours, and breaks the monotony of the times. Through the pages of the Review, I am introduced into a large circle of intelligent gentlemen, whose correspondence, together with the additions from the Editorial pen, which are always full of interest, afford many useful and agreeable lessons.

Thus, it becomes a medium, through which we converse with each other, and relate the result of our various experiments; introduce new varieties of fruits, flowers and vegetables; of circulating new modes of cultivating, and improving varieties, and of advancing the general interest of Horticulture and Pomology throughout the country. It is a great promoter of social and friendly intercourse between states, as well as individuals, and like a silken cord entwined round the hearts of our countrymen, tends to bind together, and perpetuate our happy Union.

I would fain contribute something to interest yourself and readers, but my experimental knowledge of this country, is not yet sufficient to offer anything new; but judging from what I have already seen—we have, prospectively, a great Agricultural and fruit growing region. The soil is exceedingly rich; and the climate congenial to the growth of a great variety of grains, vegetables and fruits. I have seen larger crops, and better qualities of wheat, oats, barley, etc., than I ever saw elsewhere. I have just been taking the dimensions of a few stalks of oats, the largest of which, was 8½ feet in length, and 7-16th of an inch in diameter, bearing 509 perfect kernels. Nor do I believe that this was the mammoth stalk of the field, for I think, that I could have gathered many such.

Potatos, turnips, ruta-baga, onions, cabbage, etc., seem to grow to *perfection;* I never saw them do so well in any country.

The potato is so much more thrifty and vigorous here, than in my native land (southern Ohio), that it almost looks like a plant of a larger and superior order. I have seen leaves upon potatos, that were but two months old, which measured 6 inches in width and 8 inches in length; and a friend informs me that he measured one that was 11 inches wide, and 13 long. It would be useless to state that their yield of tubers is proportionally large. They bloom remarkably full, and bear enormous crops of seed, which come up all over the ground, to the great annoyance of farmers.

Apples, pears, peaches, plums, cherries and grapes, have been sufficiently tested in the *interior* of this territory, to give growers ample assurance of their successful cultivation. But upon the coast, where I live, some doubt is entertained, as to whether peaches

will ripen well. I think I shall be able to test the matter this season, as I have four trees, which bear from 25 to 50 peaches each; they grow fast, and promise well.

Our forests and marshes abound in wild fruit, and of so great a variety as to afford a supply from the middle of May until November. The most valuable of them, are the Strawberry, Raspberry Oregonia, as I call it, but generally known here, as the "Salmon berry;" and the Cranberry, which is found in great plenty in all of our marshes. The Raspberry Oregonia, is of a brilliant orange color; very large and delicious, and one of the most beautiful table fruits that I ever saw. I inclose you a few seeds of it.

My Garden, is my everyday companion; my place of resort for recreation. Here, I spend many of my leisure hours in watching the rapid growth of my beets, cabbages, parsnips, etc; in contemplating the beauty of my flowers, and the pleasure they afford. How much more happy one must be, who has the taste and industry to *appreciate* and *cultivate* the *beauties* and *luxuries* of a garden, than he who folds his arms in ease, while brambles and weeds invade his very threshold! My garden is upon a choice spot; the very ground upon which the adventurers LEWIS and CLARK encamped, during the winter they spent upon the coast. It has also been an Indian village and encampment, perhaps for many centuries.

You know, Doctor, that it is a common thing for every one, to think his own dominion is the *very* Eden—so think I too. My place is situated upon the bank of the beautiful Lewis and Clark river, five miles from the Great Columbia, and three miles from the Ocean. Here, we breathe the pure air, fresh from the unfailing fount of Zephyrs; and hear the rustling of the forest, the songs of birds, and the ocean's roar, harmoniously combined in the great chorus of Nature's everlasting song, to gladden our hearts, and brighten our way.

Yours truly,

P. M. GILLETT.

P. S.—Your favor of May 21st, is at hand. I am much obliged for the honor conferred, by placing my name upon the list, Chairman State Fruit Committee, and will take pleasure in acting in that capacity so soon as I receive authority from MR. WALKER, the General Chairman.

PACIFIC FARM, OREGON TERRITORY.

New Strawberries.

J. A. WARDER, ESQ.,

DEAR SIR—As you seemed, during our recent pleasurable interview, to be as much interested in regard to the new and estimable varieties of Strawberries as myself, I have concluded to send you a transcript from my book of descriptive notes, which were made by Mr. Huntsman, Dr. Hedges (another amateur), and myself, when they were in fruit, and which are, consequently, more complete than the short notes you made during our rambles when here. The plants that came under my supervision the past and present years, were the results of three years' sowings, and each year there had been sown the seeds of sixteen to twenty varieties, the very finest I could select for the purpose. From each original bed, I had selected eighteen of the most vigorous plants, forming, in all, about one thousand original plants, the testing of which commenced in the summer of 1852. I made up my mind that if I did not succeed this time in obtaining many kinds, of remarkable size, beauty, excellence, and productiveness, and with vigor and hardihood suited to our climate, it would be of no use for any one else to make a trial hereafter.

The result has been to me a source of unalloyed gratification, and a gratifying reward for ten years of assiduity and zeal in the strawberry culture.

The investigations were made by the two gentlemen named and myself, they having united with me in the testing consultations, when we decided on the merits of the respective fruits. A very large number were summarily rejected, and many hundreds are left yet on probation; and these of which I now send you the notes, are a part of such as we deemed most meritorious.

Yours, most respectfully,

Flushing, L. I. WM. R. PRINCE.

N. B. The Crescent seedling, from New Orleans, which attracted some notice and

favorable expectations the last year, has been rejected as worthless.

NEW VARIETIES OF STRAWBERRIES.

H *denotes Hermaphrodites*—P *Pistillates.*

No. 724—*Globose Scarlet;* very large; rounded; beautiful light scarlet; very productive; valuable. Plant hardy and very vigorous; *P.*

No. 755—*Crimson Aromatic;* dark green foliage; fruit very large; rounded or obovate; crimson; sweet; high flavor when full ripe; very productive; estimable; *P.*

No. 757—*Prince's Climax;* monstrous size; splendid bright scarlet; rounded; some with and some without a neck; pleasant flavor; a showy and beautiful berry; extra. Plant very hardy and vigorous; *P.*

No. 758—*Coronet Scarlet;* very large; rounded; beautiful scarlet; excellent flavor; very valuable; extra; *P.*

No. 777—*Imperial Crimson;* large, short cone or roundish; dark crimson; very sweet and good; firm; keeps long; immense bearer; *P.*

No. 901—*Prince's Imperial Scarlet;* monstrous size; conical; sweet; very fine flavor; productive; *P.*

No. 902—*Transcendent Scarlet;* largest of all; dark scarlet; round; often compressed; sweet and good; productive; *P.*

No. 983—*Prince's Black Prince;* large; conical; very dark crimson; good flavor when full ripe; productive; *P.* This and the following are seedlings of Black Prince.

No. 904—*Aromatic Scarlet*; secondary size; conical; dark scarlet; sweet; juicy; very fine, rich flavor, similar to Black Prince; extraordinarily productive; *P.*

No. 905—*Luscious Scarlet;* large; dark scarlet; rounded; first-rate flavor; productive; *P.*

No. 906—*Scarlet Prolific Pine;* rather large; conical; bright scarlet; fine flavor; a seedling of Burr's new Pine, and an improvement; *P.*

No. 907—*Saccharine Scarlet;* conical, extra sweet flavor; secondary size; productive; *P.*

No. 908—*Early Prolific Scarlet;* conical, with a neck; secondary size, or rather large; beautiful, light scarlet; excellent flavor; exceedingly productive.

No. 917—*Diadem;* very large and showy; rounded; beautiful light scarlet; pleasant flavor; remarkably fine berry; extra. Plant hardy and robust; *P.*

No. 919—*Crimson Profusion;* resembles Crimson Cone in size, color, form and flavor; slight acidity; profuse clusters, none more productive; secondary size; *P.*

No. 923—*Rubicon;* very large, obtuse-cone; dark scarlet; good flavor; large as McAvoy's Superior, and resembles it; *P.*

No. 924—*Perfumed Scarlet;* rather large; rounded; light scarlet; highest flavor of all; productive; *P.*

No. 929—*Long Scarlet;* oblong, with a neck; very fine flavor; productive; *P.*

No. 936—*Crimson Prolific;* conical; crimson; sweet, good flavor; very productive; tall; vigorous foliage and scapes; *P.*

No. 747—*Scarlet Magnate;* very large; rounded, and some berries compressed; rich flavor; productive; vigorous foliage; *P.*

Orchard Gossip.

DIGHTON, *Bristol county, Mass.*

DR. J. A. WARDER:

After spending a month among the sights of New England, and especially those relating to Horticulture, I feel like redeeming the promise made you long since, to drop you an occasional social line; and do so more with the hope of gratifying my own wishes than with any attempt to benefit you. Have been spending a few days in Boston and vicinity, and visited, among others, the fruit gardens of R. MANNING, of Salem, who has one of the finest collections of pears in this part of the country, and chiefly standards. The trees are mostly in good health; quite free from blight of any kind, and are very productive, bearing, *almost every season,* as many as they *can support;* but the trees are of small size for their age, though liberally manured with marl.

MR. MANNING furnished me all desired information relative to his business, some of which may interest your readers. The

pears which he values most highly for their quality and productiveness, are the following: Fulton, Juliènne, Golden Beurre, Winter Nelis, Lawrence and Tyson.

Mr. MANNING's location is on a light, gravelly soil, something more than a foot in depth, with, in some parts a clay, and in others a gravelly subsoil. Imagine my surprise, then, on tasting some fine plums, to be informed that the "curculio never troubled his plums!" I leave you to account for this fact if you can. Then I saw a very large tree of Yellow Bellefleur, the first I had seen in New England.

The dwarf apples, as well as pears, bear well, even without application of the pinching process so strongly insisted on by many writers; but the fruit is not quite as perfect as on trees more carefully trimmed.

*We found here the Dutch currant, both white and red, no better or larger than the common sorts, with common treatment; but when shortened in every season, and liberally manured, attaining an enormous size.

Leaving Salem, I made a hasty visit to the place of Col. M. P. WILDER, who was not at home, and I could not, therefore, obtain the information sought, but as a horticulturist, made free to look at his collection of pear trees, both dwarf and standard, and was well repaid for the trouble. About one-half of Mr. WILDER's trees have a starved, stunted, or sickly appearance, owing to leaf blight, or effects of removal, or want of proper constituents in the soil; but the remainder are not only very thrifty, but very full of fruit—dwarfs that are only two or three years from the bud showing from three to six specimens each, of large size. The following seem with him to be the most productive as dwarfs: Duchesse d'Angouleme, Louise Bonne de Jersey, Lawrence, Belle Lucrative, Bezi d'Esperin, Monarch, Howell.

Taking unwilling leave of these, we rambled some time among the attractions of Dorchester, Brighton and Cambridge, feeling, at times, it must be confessed, covetous of the wealth there employed to such good purpose, in adorning the homesteads in situations by nature barren and repulsive, and drawing comparisons not, perhaps, so favorable to the west as they should be, between these and our own rude homes where the original prairie grass is still, to some extent, in possession of the soil, and anxiously wishing for the day to come when our fertile mold shall be enabled to indulge its natural gorgeous luxuriance and put on robes of cultivated foliage, which, for splendor, shall be unrivaled this side of the tropics.

Perhaps these thoughts will stimulate others, as well as myself, to bear their part more cheerfully in making their homes more attractive and agreeable; if so, the newer parts of the west may reach a high state of finish and refinement in less time than has elapsed here since the landing of the pilgrims.

HENRY SHAW,

Of Tremont, Tazewell county, Ill.

*The stock used in dwarfing pears is the Orange quince which is also the case with French dwarfs, imported by Mr. M., and they appear to do fully as well as on the Angers quince.

Pears on Quince Stocks.

IT is not a little singular, that the question of the comparative value of Quince stocks, and those called free stocks, or, in other words, stocks of the wild Pear, should have been constantly before the public for a century or more, and be not yet by any means settled. Even in the days of LONDON and WISE, as we find in their edition of *De la Quintinye*, dated 1710, the use of both Quince and Wilding are respectively recommended, according to circumstances, the recommendations professing to be backed by long experience. Thus, at page 50, it is said of "*La bon Chretien de Hyver*"—"It should be grafted on a Quince stock, because, on a free stock the fruit grows spotted, small, and crumpled." Again, of "*La Bergamot*"—"If the ground be good and light, they do best on a free stock; but if cold and heavy, on a Quince." Here we see a recognition, in *those days*, of the adaptability of the Quince to moist and adhesive soils. Again, at page 57, of "*La St. Germain*"—"It does best on a soil moderately moist, and on a free stock."

Here, then, we have a sort of antagonism in principle. That many persons have tried the Quince stocks and failed, is notorious; and that some have succeeded is equally

true; but, then, in the former case, let us ask, has the stock itself had justice done it?

We long since attempted to show, that the man who tried to cultivate Pears on the Quince, on soils adverse to the growth of the Quince, was proceeding on a fallacious foundation. We have all seen the common *Red* Currant luxuriantly growing on a warm and sandy bank, and producing fruit liberally and fine; but who would think of grafting a Red Currant on a Black Currant stock, and planting it on a dry soil?

In the present state of science, as bearing on the relation the root has to the branch, and on the influence of the latter in altering the functions of the former, we do not think any man can suppose that it is in the power of the branch so to modify the action of the root as totally to change the natural habits of the stock on which the species or variety is grafted. However, setting aside scientific considerations, a more common-sense view of the subject might almost be presumed to settle the question. Until, then, the public better understand, or better consider, this question, it will be well, for those who feel puzzled, to grow Pears on the ordinary stock. Be it understood, however, that we do not hereby desire to condemn the Quince; on the contrary, we think, that, for certain kinds, under certain circumstances, it may be used with much advantage; but who is he that can give us all the information we require thoroughly to settle the question? To be sure, writers affirm, with all apparent confidence, that this kind should be on the Quince, and that on the Pear; but we must confess that we have found great disappointment in such recommendations; and many are the complaints that have reached us from suffering amateurs, who, taking their cue from glowing accounts of the wonders performed by the Quince stock, have at once stocked their new garden—their first attempt at gardening, perhaps—with these fancy things with their highly Frenchified names.

We hope not to incur the displeasure of those who have a leaning toward the delightfully-euphonious sounds of some of the French names given by our more volatile neighbors to fancy Pears; for, if the flavor be excellent, and the kind profitable, we should have no particular objection to a Pear if it had as many names or titles as a Spanish grandee. They certainly show more taste than our Lancashire Gooseberry men, with their "Top Sawyer," "Roaring Lion," "Jolly Angler," etc.; but John Bull is a rough fellow, and almost untamable.

We must here beg to state, as our decided opinion, that where the treatment, from the seed-bed, or sucker, upward, is what it ought to be with our Pear, or Wilding; this stock will prove sufficient for every purpose, except for pots; and, indeed, for all other modes of culture, we think them altogether superior to the Quince. This we offer as an opinion; one, perhaps, that may not be pleasing to Quince-stock men. But that matters not; our object is truth.

We well know, that of all the gardens we have seen, and they amount to many hundreds, we cannot call to mind half a score in which Pear culture was carried on upon a sound basis. We do not mean to impute neglect to any of those cultivators, though such may have occasionally been the case. We mean to say, that Pear culture seemed less understood than the culture of any other fruit.

Let us hint at the reasons why Pears on the free stock, so often succeed badly. The wild, or free stock, by nature, is inclined to make deep roots, and deep roots are ever averse to a thorough ripening of the wood. And why? it may fairly be asked. The answer is, that deep roots imbibe a too-copious and constant supply of moisture, and that, too, at periods when a degree of mellowness, if not of partial dryness, is of the utmost importance. Pears should cease to grow, or, rather, to elongate in the young shoots, by the end of August; after which period, the powers of the tree should tend to concentration rather than dispersion. That this concentration, or accumulation, of the prepared sap is beneficial in enhancing both size, quality, and color in the fruit, is amply proved by the effects of ringing; by which means a preternatural supply is arrested above the ringing point. In such cases, not only the fruit, but the young wood and the embryo bloom-buds become altered in condition, at the expense, however, in some degree, of the

longevity of the tree, here, however, there need be no cause for alarm, as the Pear is naturally so long-lived as to make this point totally unworthy of consideration.

We think, too, it may be safely inferred, that the *temperature* of the ascending sap is a matter for serious consideration. Surely, the moisture absorbed by roots at three feet in depth, cannot be precisely the same, in this respect, as that absorbed from within a foot of the earth's surface! The soil at the former depth being, probably, in July and August, about fifty degrees, while that within a foot is nearer to seventy degrees: surely both cannot produce *precisely* the same result!

However, it is a well-known fact, that whatever the merits of the Quince may be as a stock, the Pear-stock will succeed, in ninety cases out of a hundred, without preparation; while of the Quince, probably not twenty would suit. The *deep roots*, then, got rid of, we have little doubt that the ordinary stock would suit well the majority of cases. And how shall these deep roots be got rid of? If right in our antecedents, this will be a small difficulty. Frequent transplantations, beginning from the very seed, sucker, or layer of the stock, and *station planting*, according to the maxims *first made patent* through the medium of THE COTTAGE GARDENER, offer, in our opinion, the only solid chances of success. The rest, we fear, is all "but leather and prunella."

There is still a vast difference of opinion as to the use of stocks; some vowing a lasting fidelity to the Quince stock. This strongly reminds one of the discussions in the case of *Manetti* versus *Dog Rose;* although we cannot make a complete parallel of the two cases. I still think that some kinds, perhaps many, will be best dwarfed on the Quince, providing the soil suits that stock; but, how any man in his senses can think, that because an unfortunate Quince has a fancy Pear bestriding him, that this same compound will thrive where a genuine Quince, without any superaddition, will not, I am quite at a loss to guess. Would this apply to a Larch, with a Lebanon for a leader? If so, the roots of plants are certainly very good-natured things; and as to *power of selection*, why this will almost settle this long-disputed point at a blow.

In order to illustrate the matter, let us suppose Cranberries grafted on some of our Vacciniums which are thriving in dry upland-heath soil. Who will engage that we have a crop of Cranberries?

Even in LONDON and WISE'S days, as I find in their "Complete Gardener," before alluded to, De la Quintinye talks of Pears answering on the Quince, *if in clayey and moist soil.* Perhaps, nothing is so ill-understood, in the whole realm of Horticulture, as the question of stocks. Somehow, this utilitarian affair is left entirely to our nurserymen.

My opinion is still, that if the free stock were annually transplanted for the first three or four years, from the seedbed, there would be little need of Quince stocks. The sole problem rests here, as I think. In order to ripen the wood of tender Pears they *must depend* on surface roots chiefly. The Quince produces these in abundance, but it is a saucy customer: not everybody can understand his bent. Pear stocks, with such roots, are the most natural stocks; but it is not their habit to produce such. The question then is, Can they be made to do so? I at once answer, Yes. I have said here, in an off-hand way, "transplanted annually the first three or four years." Now this must be taken guardedly, for it is not obliged to be exactly thus. Our practical men will carry out this to their own taste. I only wish that I could get some of our nurserymen to try this plan, for assuredly, the Quince is but an awkward customer as at present handled.

Cottage Gardener. R. ERRINGTON.

REMARKS.—This article, from one of the most practical and most observing cultivators of Great Britain, will be read with interest by those who have become interested in the great question of Dwarf and Standard Trees. I have not yet determined the question of stocks, to my own satisfaction, and presume many others are in the same state of doubt—some varieties do not succeed, under any circumstances, on the quince, but others do so well, in proper soils, that I should gladly plant by the thousand, nor feel that there was any risk in the experiment. The pear is certainly the most natural stock, and the suggestions of Mr. ERRINGTON, as to root management, will be well worthy the attention of Planters. J. A. W.

The Grape Malady.

This terrible *epidemic*, if our brother Doctors will allow this term to be applied to the sufferings of plants, appears to spread fearfully, and to resist all efforts to arrest its progress, and, indeed, to defy the investigations that have been directed to its explanation. The result is disastrous, and we may well fear that it will spread in this direction and blast the prospects of our flourishing young vineyards. As will be seen by the subjoined article from the *Gardener's Chronicle*, it has attracted much attention:

THE GRAPE DISEASE IN EUROPE.

There is nothing more curious, if it be regarded only as a philosophical speculation than the rise, progress and decay of diseases themselves—why is it that they seem to run an appointed cycle, and then to have exhausted their virulence and to die out? The leprosy, the scourge of the middle ages, is well nigh extinct; of the sweating sickness there is no other standing memorial than a rubric in the English Prayer Book; small-pox, though struggling hard for existence, will soon be numbered with the things that were; and Fracastor's celebrated poem abundantly proves that the plague he celebrated has lost much of its malignity. On the other hand, consumption, almost unknown to former ages, yearly mows down its tens of thousands; and cholera has taken the place of the plague and of the black death of Europe. These, no doubt, will run their course in like manner, and leave fresh diseases—such as we, ourselves, have seen the influenza—to exercise the skill of future physicians, and to carry off their yet unborn victims. As it is with man, so with plants. In this sense, also, old Homer tells the truth: "As is the race of leaves, so that of man." The potato disease we have chronicled year after year. It may not, by-the-by, be generally known that all the horrors of an Irish famine have been suffered in Gallacia from this cause. The greater part of the riches of the Church of Compostella has been devoted to its relief, and has proven but a drop in the ocean. But the grape disease—as directly affecting the interest of half Europe, as cutting away the only support of hundreds of thousands—is of far more fatal consequence, and will hereafter be considered, unless some means can be discovered for its cure, one of the great scourges of the century.

Those who are interested—and who that can feel for human misery is not interested?—in the question, have now ample opportunity of examining the disease in our own English vines. A collection of specimens of this new scourge lies before us as we write, selected in different stages of the complaint, and exhibiting its various phases. The latter may, on the whole, be reduced to two. The more ordinary appearance presented may be thus described. The upper part of the leaf rises in well-defined conical blisters, in the very earliest instance, without any change of matter, whether above or below them. This is the first stage, and lasts but a few hours. Gradually, within the cavity of the pustules, a fungus is formed, at first of the color of deal sawdust, but gradually reddening and darkening. By degrees this fills the whole blister, the exterior appearance of the leaf remaining unchanged; and this is the second stage. In the third, confluence of the pustules commences—generally, at the edge of the leaf furthermost from the stock; the fungus becomes of a brown red; the exterior of the cavity assumes a copper or purple hue; and the tissue of the leaf begins to perish. Finally, the whole interior is covered with fungus, a rusty matter forms on the exterior, the edge of the leaf slits up and crumbles; and the whole leaf falls to pieces. The other phase is, at all events, less offensive to the eye, though equally fatal to the plant. It commences by the appearance of brown or purple blotches on the upper side of the leaf. The edges curl up as if they had been burnt. The blotches spread, penetrate the tissue of the leaf, become brittle, split up, and the whole drops to pieces. A cobweb like film, in both cases, frequently covers the under surface of the leaf. On the grape itself, the whitish mildew has usually formed, when it is of the size of a small pea. The spore extends itself with great rapidity by radiating filaments; they merely attach themselves, without penetrating the cuticle; the

upper part rises, rounds itself, ripens, and is carried off to some other grape where it can fructify.

No wonder that this disease should have attracted the attention of the most eminent naturalists and practical men. In Germany, Professor Mohl; in France, Louis Leclerk; in Portugal, Mr. Forrester; in Italy, Professor Sanginuette; and in England, Mr. Brokedon (the latter in his very interesting lecture before the Royal Institution), have all treated the subject.

It was in the spring of 1845 that this fungus first made its appearance in a hot-house at Margate. By a somewhat ambiguous compliment to the gardener who first noticed it, Mr. E. Tucker, it has received the name of the *Oidium Tuckeri*. In 1847, it reached France. For three years it returned with increased violence, but still not exciting any great alarm, till, in 1851, its ravages created a panic both there and in Italy. It spread along the Ligurian coast to Naples; it came back through the Tyrol, devastating Switzerland and touching Baden; it extended itself across the Illyrian States to Hungary; it coasted Mediterranean Spain to Malaga; it entered Algeria, the Archipelago and Syria, but its most fatal ravages were reserved for Madeira. There, where the poverty is always extreme, and where the vines are the only resource, the misery is perfectly frightful; the only staple of the island is ruined; and what is to become of its 120,000 inhabitants is past human imagination.

Portugal itself, it may be hoped, will not this year suffer so severely as her neighbors, though it must be confessed that the very latest reports are sufficiently gloomy. The vintage of the Alto Douro, should it be ruined, would inflict an incalculable blow on the national prosperity, and therefore it is not wonderful that a complete panic should prevail at Porto. A tour made by Mr. Forrester to the wine districts, in the end of July, leads to the belief that for this year, at least, the scourge will there appear in a moderate form. He was even struck with the apparent vigor and health of the vines; and he examined, with the utmost attention, the wine districts from Mesatrio to Peso de Regoa, and as far as Villa Real. He confesses, however, that in some places, and especially about the Caldes de Moledo, he saw the fatal fungus; he then calculated the yield that the Alto Douro would have given at 100,000 pipes, but supposed that the fifth part of this would be lost through the "molestia." It is worthy of remark that in the Minho, and especially round Barcellos, there has been for some years a chestnut disease of similar character, and that great fears are entertained of the entire destruction of that tree.

As in all epidemics, the most absurd reasons are assigned by the peasantry of the infected countries for the existence of the *Oidium*. Just as, in the plague of Milan, men were tortured to death on suspicion of having smeared the walls with plague ointments; and in that at Prague, the Jews were torn in pieces on the plea that they had poisoned the wells—so at Strasburg, the vine-growers will have the cause of the grape disease to be the smoke of the engines on the Paris and Strasburg railroads; at Genoa they attribute it to gas; the bourgeois of Marseilles to bad air; and the *lavrador* of Madeira to the English *vapores*. And the remedies proposed are as contradictory, and in many cases as absurd as the causes alleged. "It is plethora," says one, "reduce the vine and you cure it." "It is atrophy," says another; "manure the tree and you will remove it." "We want more rain," cries a third; "more sun," persists a fourth; "cut off the affected shoots," recommends a fifth; "tobacco is a specific," urges a sixth. And the list might be extended to sixty recipes, instead of six. One only has been found certain, and that is impracticable on a large scale; the puffing of sulphur over the bunches and grapes, or the vaporizing it on hot-house pipes.

What effect this year's *Oidium* may have on the social condition of France, where, out of five hundred millions of hectolitres of wine, half will perish, it is impossible to say. We can scarcely imagine a parallel case in England. A barley disease would deprive the English laborer of his beer, as the fungus in question deprives the French peasant of his wine; but the employment of the former does not depend, to such an

extent, on the barley crop as that of the latter on the vineyard. In the meantime, one thing is evident, and it is not an altogether useless lesson to scientific pride. No human means have as yet been found capable of arresting, or even checking the plague. And it is curious to see how, in different language, the ignorant and learned agree in one confession. "Our only trust," says the Malaga peasant, "is in La Santissima." "We can but hope," writes Mr. Brockdon, "that the power which has created the *Oidium* may withdraw what appears to us such a fearful scourge."

In the *Revue Horticole* of a late date, I find an article from M. Ysabeau, one of the conductors of that excellent journal, in which he reports the failure of the attempts to arrest this disease by fumigations with pitch, which had been recommended as having produced wonders.

After having fumigated a trellis until the leaves fell off, without checking the progress of the disease, the experimenter determined to try a decisive experiment. For this purpose, he selected a young vine, bearing a single partially developed cluster; near this, but without affecting it by the heat, he burnt some pitch on a portable furnace, directing the smoke to the bunch which was inclosed by a bell-glass—the fumigation was continued until the grapes and the glass were completely blackened. The bunch had no trace of the disease, and he flattered himself that he had discovered a cure; but, a week afterward, the black soot was replaced by a white filamentous powder, which his microscope proved to be the *Oidium*, and he was undeceived. The conclusion drawn from this carefully conducted experiment is, that no useful effect was derived from the tar fumigations, although the operator does not insist that it will be useless in all cases.

The following, selected from the *Practical Agriculturist*, a French periodical, was read at a recent meeting of the Cincinnati Horticultural Society. M. Seringe, is Director of the *Jardin des Plantes*, and Professor of Botany at Lyons.

"The following facts are the result of my observations of the vine disease during this year, 1853:

1st. Despite the atmospheric variations of the season, the grapes which escaped the frost, the hail, the late rains, and the Oidium, have ripened well, and the wine will be of good quality.

2d. The branches, upon which the fruit was attacked by this parasitic fungus, have not been so much injured as last year, (1852).

3d. Layers, made last year (1852) and this, have produced vigorous shoots, and have borne fruit which has resisted the disease better than on branches not so layered.

4th. Low vines, and particularly those which have not been trimmed, and whose branches were upon the ground, had more sound grapes than others.

5th. In very rocky soils, the grapes were less diseased than those on lands free from stones.

6th. Grapes on trellis, have ripened perfectly, when they had been rubbed with a soft brush at the moment the Oidium was first observed.

7th. Bunches on trellis ripened equally well after having been plunged into a solution of nitrate of potash (*saltpeter*) while those on the same vine which were not so treated, perished from the attacks of the Oidium.

8th. A weak solution of hydro-sulphate of lime sprinkled on the vine, also arrested the development of the parasitic fungus.

9th. The trimming or cutting off the leaders above the second leaf beyond the bunches, after the flowering season, and the successive repetition of this operation upon the laterals, (always above or beyond the second bud) appear to preserve the bunches from the attacks of the mildew.

10th. Throwing handfuls of sulphur, or still better, applying it with a bellows upon the bunches when they are moistened by rain, dew, or otherwise, succeeded perfectly, if done as soon as the disease appeared; the grapes resumed their natural tint, and became well colored.

11th. The late falling foliage, when dusted with sulphur, ripened perfectly.

12th. The grapes on trellis, upon which flowers of sulphur had been applied without being previously moistened, have not been

attacked, while all others on the same trellis were diseased.

13th. I was assured that vine cuttings, sprinkled with hydro-sulphate of lime, after they were cut, but before they vegetated, were preserved from the Oidium. If this exemption be permanent, it will be a good preventive of the disease.

14th. It will be well, in all cases, to remove the excess of old bark occasionally, from old vines, since this matter furnishes a hiding-place for insects, for their eggs, and also for the spores of the parasitic fungus, the Oidium, and may also injure the vines by retaining too much moisture. SERINGE.

I shall not add any observations upon this subject, since your long experience in the grape culture, as well as your intelligence, will enable you to appreciate these postulates at their true value. With respect, gentlemen, yours, J. FOURNIER."

The reading of this communication elicited some interesting remarks, they were chiefly in concurrence with the views expressed by M. SERINGE. The application of sulphur, either alone or with lime, is well known to be very efficacious when applied to other varieties of mildew. The observation No. 3, was thought to indicate the advantage of shallow roots, and the disadvantage of allowing the radicals to penetrate too deeply into the soil.

New Grapes.

FROM THE AD INTERIM FRUIT REPORT TO THE PENNSYLVANIA HORTICULTURAL SOCIETY, FOR OCTOBER.

Peter Raabe—Seedling Grapes.—In 1845, Mr. RAABE obtained a collection of Grape Seed from Germany, which he planted in a bed in his garden. Many of these seeds vegetated; and as the young plants were exposed, without the slightest protection, to the inclemency of the weather, none but the hardiest survived. Of these the following four have already fruited, and are unquestionably varieties of great merit:

The Brinckle.—Bunch large, rather compact, sometimes shouldered; berry five-eighths of an inch in diameter; round; black; flesh solid, not pulpy; flavor rich, vinous, and saccharine; quality "best." Fruited in 1850 for the first time.

The Emily.—Bunch large, not very compact, occasionally shouldered; berry below medium, from three-eighths to one-half of an inch in diameter; round; pale red; flesh very juicy, with little or no pulp; flavor saccharine and delicious; quality "best," for an out-door grape. Fruited in 1850 for the first time.

The Raabe.—Bunch small, compact, rarely shouldered; berry below medium; round; dark red, thickly covered with bloom; flesh very juicy, with scarcely any pulp; flavor saccharine, with a good deal of the Catawba aroma; quality "best." Although the Raabe originated in the same bed with the Brinckle and Emily, its unequivocal Catawba flavor and native leaf induce us to believe that it sprang from a chance seed of the Catawba that had accidentally gained admission into the bed. This opinion is strengthened by the fact that the Catawba was in bearing in Mr. Raabe's garden at the time he planted the seed he received from Germany. It fruited in 1850 for the first time.

The Clara.—Bunch medium; not compact; berry medium; round; green, faintly tinged with salmon when exposed to the sun; flesh tender, juicy; flavor rich, sweet, and delicious; quality "best." Fruited the present season for the first time.

The Graham Grape.—An accidental seedling raised by Mr. Graham, gardener to the Philadelphia Blockley Alms-House. It sprang up in 1845, and fruited in 1850 for the first time. Bunch of medium size, shouldered, not compact; berry half an inch in diameter, round, purple, thickly covered with a blue bloom; contains little or no pulp, and abounds in a saccharine juice of agreeable flavor; quality "best." The leaf indicates its native parentage. It is probaly a natural cross between the Bland and Elsinborough, both of which were in the garden where it originated.

Western Seedlings.—But two have been presented during the past season, but another year will bring forward a large number, among which we have great hopes of finding some that will be considered "*best.*" Two large premiums will prove a stimulus to exertions in this department.

Grapes.—R. BUCHANAN and G. SLEATH, exhibited a seedling grape, originated in the vineyard of the latter. It is not Catawba, the bunches are smaller and more compact. Though a pleasant flavor, it did not seem to be worthy of especial regard.

GILES RICHARDS, of Elland, Butler county, presented specimens of a seedling, purplish grape, which has great merits. Bunches medium size, not compact, and having a long shank; berries medium size, skin rather thin, no pulp; seeds small, juice abundant, and of very delicate flavor. This is supposed to have originated from the seed of a Malaga grape, planted in a flower-pot, by Mr. RICHARDS, and since grown beside his house, where it has proved hardy.

Botanical Knowledge.

It is to be wished that our Florists and Gardeners were better instructed in the principles and practice of Botany. I know of no study more important in their vocation. It would seem to be a particular consequence of his business, that a good Florist should be a competent Botanist. The daily pursuits and associations of his life, the expectation of his customers, an ambition fully to comprehend his business, must constantly suggest the importance of a familiar acquaintance with at least the more practical branches of this delightful science. To understand the nature and composition of pot-earth; to have experience in the art of trimming, watering, and perfecting his plants; to sow, rear, cut and transplant successfully; all this is indispensable, commendable, useful; and will distinguish the efficient, capable cultivator from the blundering pretender. It is, indeed, one of the prime objects of this publication to aid the producer, whether of flowers or fruits, to arrive at the best results, by the most economical processes. Even here, high and valuable attainments may be reached. Beauty may be enhanced and utility perfected. But there is something more to be done than this. Something more to be known.

It is one step higher to know accurately and promptly the *names* of the plants with which the cultivator deals. Here the Florist especially should be sure and confident. Amateurs of flowers depend upon the accuracy of his knowledge for the correct names of the plants they purchase. A misnomer from him circulates far beyond the door of his greenhouse, and leads to confusion and embarrassment. I have known a wrong name go through a large company, starting from the mis-spelt tablet attached to an attractive plant. This ought not so to be; and yet how often is it the case. The mistakes to which inattentive persons are liable are twofold: error in the application of a name, and error in the spelling. When both are combined, the case is absurd enough. Either error is altogether inexcusable in the professed Florist. When he purchases a plant, he should see that it is properly ticketed, and confirm by an examination of his books, the correctness of the name he finds applied to it. He should ascertain beyond doubt that it is rightly named, and also that the name is rightly spelled. And then, may we not be allowed to say, he should take care that no plant leaves his place without having its correct name conspicuously affixed to it. The practice of selling plants unlabeled, giving the name to the purchaser orally, can have no palliation. It is productive of innumerable mistakes, and indicates carelessness, if not ignorance, on the part of the seller. "That is the name the gardener gave me;" said the good lady who labeled her plant "Fushy gracilly." An equally dull dealer was responsible, no doubt, for "Senesha oree" on another tablet. And it is not long since I saw "Seedam Scboldi" stuck in a pot just as it came from the greenhouse; the work of some assistant doubtless; but the careful Florist should see to it, that all these things are right, before the plant leaves his possession; that the name is there, that it is the true name, and that it is plainly written and accurately spelled. I have seen some labels so defaced by dirt and moisture, that the dealer himself was at fault to decipher the names upon them. Can there be any excuse for his allowing his plants to leave his shelves in that condition? To do so is as injurious to his own reputation as it is unjust to his customers. Let us have no more of it.

I may say here, incidentally, that there is undoubtedly a source of error in nomenclature for which our Florists are not responsible. It grows out of the large number of synonyms that are unfortunately and frequently found attached to the same plant. That is, the same plant does not always bear the same name in every catalogue. There are some not uncommon plants that have as many as six, and even eight, synonyms tacked to them. This is a great evil; one it will be the object of this Magazine to

assist in correcting. We have, I think, many thousand more names than species or even genera of plants. They must be reduced to the just limit and requisition of nature. To accomplish this is a labor of time, but it should certainly be commenced. Having paid some attention to the difficulty, I purpose attempting to illustrate and relieve it in some early papers. Many examples now occur to me, but they are not important to my present object. Speaking in a tone of reprobation of the errors of inattention and carelessness on the part of flower-dealers, it is but just to make this reference to a prolific source of many others equally confusing to the amateur, but more excusable in the producer.

But important as is a correct nomenclature and an accurate orthography, even the most perfect attainment in both, will not make a Botanist, and should not satisfy the cultivator. He should be able to see into the inner life of his plant; to comprehend its characters, and recognize from a knowledge of the value and relations of those characters, its true position in the great vegetable kingdom. He should not be satisfied with a glance at the label of the professor or dealer from whom his plant was procured. He should be able to look deeper and farther, even, than its physiognomy and external appearance. He should know why the specific name it bears, has been given to it; why it is placed in the genera whose name it takes; what are its family relations, and its proper classification in the Natural System. This knowledge would give him confidence and self-reliance. He could then appreciate the distinctive features of every plant in his list, and verify for himself its names and special alliances. He who is accomplished in this enlarged view, surely occupies a higher position in his profession, than he who, possessed of a retentive memory, merely remembers with accuracy the names he finds upon the labels of the plants he deals in. What shall be thought then of him, who not only knows nothing of classification, and system, and physiology, and character, but is deficient in recollection, and defective in orthography! Is it not, indeed, to be wished that all such were better instructed in these things? Nay, that all whose profession is the culture and sale of the varied products of the vegetable world, were not only students and memorizers of names, but masters of at least so much of the principles of the science of Botany, as has a practical connection with their business.

Let me not be understood as exacting too much from the Gardener and Florist. I know that he has much to do. I know he has many perplexities and distractions; many anxieties and disappointments. I am quite aware also, of the magnitude of the science of Botany; any branch of which, fully to acomplish, would demand a whole life of unremitted observation, and laborious analysis. I mean only to indicate the importance of a comprehensive knowledge of the most practical principles—such principles as come within the scope of his responsibilities. He may not have time to study attentively the delicate organic structure, or anatomy of his vegetables and flowers; to understand their functions and physiology; or be fully able to interpret the technical language employed to describe and characterize their organization. But it is reasonably expected of him, that he be competent and thorough on the no less difficult branches of Classification, Description, and Nomenclature. These are large subjects; and, as I have intimated, a knowledge of them embraces more than can be learned by a comparison of external forms, or an inspection of a dealer's labels. And here is where accuracy is expected. The Florist should know of himself, by a just and prompt recognition of characters, and by his own capability of correct analysis, the name and classification of every plant he receives into his garden or greenhouse. And so shall he be able to detect the errors of others, and correct and avoid those to which he himself is liable.

I shall return to this subject again. I think its importance is not magnified. A walk around the tables of one of our Horticultural Exhibitions, will convince any attentive observer, that these strictures, though by no means personal, in any designed direction, are justified by the facts.

J. W. W.

The Lily of the Valley.

THE out-door culture of this Lily, is the first consideration; for, like the Sea-kale, its style and quality, when forced, depend much on its high culture during the growing season. The Lily of the Valley will grow pretty well in any good garden soil; but to grow it in the highest perfection of which it is capable, some extra consideration must be given to the compost. It succeeds to admiration with us in a dark and unctuous loamy soil; and we have a north border here in which I have grown my whole stock for twenty-two years, merely changing from one end to the other in making new plantations. But this border is exceedingly rich in decayed vegetable matter; and those who wish to excel in Lily of the Valley culture, must not fancy, that because this plant is found growing tolerably well in neglected situations it is averse to manures and high culture. We have seen them grow in woods in great breadths, and in tolerable style; but then the two chief conditions were present—partial shade, and abundance of the decayed leaves of many years.

As to the staple soil, then, for Lilies of the Valley, I am of opinion that a darkish and somewhat stiff soil will produce the finest buds; and one essential is, that the ground be not liable to droughts, for they love a permanent moisture. As to shade, I have ever found them finest on a north border; but, be it understood, they are not within five feet of the wall, consequently, the sun shines freely on their foliage; but then the border surface inclines considerably to the north, and, of course, the ground is much cooler and damper than it would be on a southern slope. It is very probable that an east or west border would be better still.

There are, at least, three distinct modes of cultivating Lilies of the Valley for forcing. The first, growing them in patches in the open ground, and potting such patches when two years old. A second is, to grow them in pots; the latter plunged in a rich medium; and a third, to take up the roots, and single them out in November, sorting all the finest eyes, and placing them thickly in pots adapted to the purpose. I think, that for very early forcing, those grown in pots will be found the best, inasmuch as it is necessary that the roots should not be disturbed, and that the crowns should go to rest betimes. For succession crops they may be cultivated by the first mode; and for the latest the third mode may be best adopted. Let it, however, be distinctly understood, that I do not by any means desire to "hedge in" any of our readers by this course alone; they will do well by any of the above modes, if the roots be strong; if they are badly grown, the forcer will be defeated in his aim. I may now detail the planting process, together with the preparation of the soil.

Let a plot of ground be selected in the beginning of March; a plot possessing the conditions before named. It must be deeply dug, and the parts well broken, and during the process means must be taken to introduce as much as four inches in depth of very old manure; the kind I prefer is old hotbed linings, composed of about equal parts manure and tree leaves, but which have crumbled to pieces with age and turning. To those who cannot obtain such a valuable article, I say, lay hold of any old black residue, whether of the wood pile, the rubbish-heap, old thatch, or old rotten weeds; anything which has once been living vegetables, and has become a black residuum, through age and exposure to the air, is eligible. This, however, I address to the needy; for, after all, there are few things so good as the hotbed linings. The ground being thus prepared, stations may be marked out for the Lily patches, if to be forced in pots, according to our first mode. We force them in pots of about nine to eleven inches diameter, and it is necessary so to plant the patches, as that they may readily fit the proper sized pot when taken up.

The ground is marked in lines of two feet distance; these lines to receive the patches of Lilies at about fourteen inches apart; therefore, pegs put down at that distance from points around which a thick cluster of Lily-buds has to be planted. This done, a pot of about seven inches in diameter is used to stamp circles around each peg, and on this circle, and within it, the Lily-buds are dibbled as thick as they can be placed. Each patch will thus be made to contain from twelve to fifteen eyes or buds, which is as many as are necessary to form a good potful of blooms; and when planted, a top-dressing of rotten manure, in a mellow state, is spread nearly three inches thick all over the surface of the Lilies. Through the ensuing summer they are kept clear of weeds; and after a second summer's growth they are first-rate buds, and will give every satisfaction to the forcer.

I may now advert to the second mode: *growing* them in pots. I will not say what has been done, or what may be the general practice; but rather point to what I conceive would be a superior practice. I would advise that pots of a peculiar character be "made to order" for them; and that for two reasons—one, that none of our ordinary pots are well adapted to set off their character to the best advantage; and the other, that pots differing somewhat from the common run will facilitate high culture. They need a pot wide and shallow, rather than narrow and deep; and I think we may say, pots about ten inches in

diameter, and about seven to eight in depth, would be highly eligible. But as I have to recommend a plunging mode of culture, in order that the roots may avail themselves of a richly-prepared soil outside their pots, the pots should have plenty of holes all over their bottoms, and even round the side, about a couple of inches above the bottoms of the pots.

The crowns, or buds, should be planted as thickly as they can be set in the beginning of March; and the compost must be of the most generous description. About half of an unctious loam, and the other half old dung and leaves, almost become a mold, with a little silver sand, will grow them well in pots, putting some coarser manurial matters over the drainage; and if crocks are used, they should be very coarse, in order that the fibers may get through with facility. These things done, I have to recommend a prepared bed to plunge them in. Nothing would be better than a bed of half-decayed leaves, or anything of similar texture, even manurial matters. This should be quite above the ground level, in order to avoid swamping. As before observed, a situation where they would get only half-a-day's sun would be well, only there must be no trees overhead. They would require regular waterings through the season, and, when in active growth, liquid manure.

Now, it will require a second season's growth to produce *strong blooms*, although, with every appliance, they may be bloomed the first season, providing the roots were very strong. A second season's culture, however, will amply repay the exercise of patience. In November of the first year they had better all be moved, and those roots which are through the pots trimmed away; for if suffered to proceed unprotected, I fear the check would be too great in the second autumn. Being turned round, therefore, or replunged, they will be ready for another summer's culture; and about the second week in October, or as soon as the foliage begins to assume an autumnal tint, those which are required for *very early* forcing may be unplunged, the side fibers outside the pots cut off, and the pots placed in a very sunny corner, to hurry their buds to a state of rest. Before the sharp frosts set in they may have their decayed foliage cut away, and be plunged overhead.

About the third practice little need be said. The soil will, of course, be prepared as advised in the first detailed practice, and in planting, the roots may be dibbled thickly in rows, or planted all over the bed. In all other respects they may be treated as the others; and at the end of the second summer they will be fit for forcing. The buds intended for selecting from must be taken up in the beginning of November, and the roots sorted carefully—all the largest crowns being reserved for potting. These may be singled out and dibbled into any size of pot or box desired, and protected as recommended for the others.

Thus much for culture out-doors. Now a few words about the forcing. There is no difficulty in this procedure if plenty of time be given; for they would, doubtless, blossom much before the usual period, if only placed beneath the greenhouse stage; but to obtain good blooms in December and January is altogether another affair. To accomplish this, it is necessary to resort to bottom-heat, and I have found from 70° to 75° most congenial. My practice is to plunge them overhead in warm tan or leaves; but care must be taken to uncover them as soon as they have sprouted about two inches in length, or they will become so weak as not to be able to sustain their weight. It is necessary to place a lighter or finer material over their crowns when plunged, or the pressure of the leaves or tan will bind them down and spoil their character. I always pile up a mound of finely-riddled old tan over them, and this answers admirably. We sometimes force them in the mushroom-house; sometimes in front of a pine pit; and, indeed, the structure is quite immaterial, as darkness is essential until they have sprouted a couple of inches. Care must be taken, on their first introduction to light, that it be done gradually; and it is best to place them in a shady part of the greenhouse or other structure for awhile, protected equally from cold currents of air and from sunshine; and they should be frequently syringed; in fact, a rather moist atmosphere is indispensable, and a temperature from 50° to 60° will be amply sufficient until in blossom, when the cooler they are kept the finer will the blooms be; the longer they will endure, and the higher will be their scent.

When the foliage becomes green, by exposure to light and air, they will be improved by sunshine at an early period; but as the spring advances little sunshine will be necessary. They will require water liberally while in blossom. The freer the circulation of air the higher will the scent be, and I should prefer, at the blooming period, a temperature of from 40° to 55° to a higher one, and they will thus continue much longer in blossom. R. ERRINGTON.

[WHY do we see so little of this precious little day-star? emblem of purity, nay, even of sanctity, in the minds of some, and beaming with brightness, and filled with fragrance, it cannot fail to be a universal favorite, wherever known, and should be known by all. The roots may be obtained from any gardener, and may be removed at almost any time of year, but best in the autumn.—ED's.]

New Plants.

We have received from Dr. Kellogg, of St. Francisco,—a gentleman we have much pleasure in numbering among our correspondents,—descriptions of several new and interesting California plants; two of which we give below. Others will appear in future numbers. Several descriptions of Ohio plants, presenting new specific characteristics, and interesting from the new localities in which they are found, are deferred to the next number. We have several lists and descriptions promised from distant friends, and shall be glad to add to the number of our correspondents in this inviting department of Botanical Literature.

THE GIANT ROOT.

This plant belongs to the natural family of the *cucurbitaceæ*, or cucumber tribe.

It is an *Echinocystis* closely allied to *Sicyos*, and still involved in some obscurity from the very unsatisfactory descriptions of authors. We shall describe it under the name of *Echinocystis radix gigantea*.

This is a very luxuriant, herbaceous vine found in great abundance on sandy ridges or drifted hillocks, also in light rich soils, in all parts of California. It overspreads the ground or climbs over small shrubs, forming a dense mass that every one must have observed. The enormous root so disproportionate to the vine is not so generally known. The stem is five-sided or angled, and ten-ribbed with intermediate furrows; the claspers or tendrils at the base of the leaves are one to four parted; the leaves are roundish heart-shaped, seven to nine lobe-angled, the points of the angles slightly turned to one side, and the mid-rib extended a very little beyond the margin, forming a little weak prickle on the points; the margins of the leaves *entire*.

Both the male and female flowers are bell-wheel-shaped, and generally only five-parted, the divisions oval-lanced to an abrupt point, with no separate calyx, or barely two or three thready, almost imperceptible greenish points, the whitish bracts merging into the greenish calyx.

The male flowers are on very long, loose (compound racemose) foot-stalks, from the same axils of the leaves as the *single* fruit-bearing flower—these sterile flowers have apparently five stamens, joined together into a globose head somewhat obscurely in three parcels.

The fertile flower is on the end of the fruit at the tip of a little thread like tube; the central style is very short, the top or stigma largely swelled and very obscurely two-parted or rather fissured one way, and often partially crosswise; beneath this may be sometimes seen three or four very short and extremely minute rudiments of stamens. All the flowers are of a greenish white color with greener streaks, densely coated on the inside with a very short, glandular, mealy pubescence; all other parts of the vine are clothed with a few short, soft hairs.

The fruit is of the shape and size of our largest limes, covered with very long, weak prickles and containing about four large seeds in the same number of cells or spongy divisions, one seed smaller and often abortive or false; these nutty seeds are three-fourths of an inch long and half an inch broad, oval-oblong and flattened like the end of one's finger; the shell is hard, brittle, or bony, smooth and even like an hazelnut—(a very slight melon-seed-mark at the germinal end). What is singular, they sprout like the seed of the pines *above ground* and shoot their straight root into the sand. The kernel is edible, of a nutty flavor and abounds in oil; this oil is very easily obtained by bruising and pressure, and burns with a brilliant flame—when better known it may prove of some utility. It is a great favorite with our Blue-jay (the *corvus cristatus?*) whose impatience for the sweet morsel will scarcely allow the fruit to ripen.

The mammoth size of the root is somewhat notorious; it is styled, in common parlance, "Giant of the Earth," "Man Root," "Giant Root," &c., from its fantastic shape; the root often assuming the figure of a man, having head, neck, body and limbs of the fullest proportions, and extending its straggling roots to unknown depths. In point of quality, it is beyond description the most unmitigated of all earthly bitters—a fit representative of the bitterness and subtle

ingenuity of the most perverse and vicious of mankind.

In light soils its shape is more regular, like the beet, and of all sizes up to nine feet in circumference; the texture is fleshy, somewhat soft, of the consistence of the common turnip, juicy and yellowish within, with a creamy russet-colored rough surface.

We have very little knowledge of its medical properties; it is reputed to be tonic and used as bitters generally are—ten drops are sufficient—but it is too repulsive to any but the vitiated tastes of dram drinkers.

A root we dug up, shaped like a demijohn, two and a half feet across, may be seen at the Sealrocks on the sea-coast.

A. Kellogg, M. D.

ICE PLANT.

A splendid species of the Ice Plant, a native of California, is found in the greatest abundance along the coast and bay in the vicinity of San Francisco. Dr. Torrey observes, "there are two or more species said to be *naturalized* in California, and one Mr. Nuttall suspects to be native; but there is no account of the species in his notes, and we have seen no specimens." The subject is thus dismissed by this eminent author.

Without other means of reference, we feel some misgivings; but shall venture to describe this succulent plant as a *Mesembryanthemum Æquilateralis*?

The stem is fleshy with a ligneous center; running on the sand, it throws down fibrous roots at the joints, is slightly three-sided, and the younger internodes two-edged swelled upward—the branches originate from the axils of the leaves, and rarely ascend to more than six inches above the sandy hillocks which it overspreads.

The leaves are fleshy, three-sided, one to two inches long and three-eighths to one-half an inch thick; the back and point of the leaf most beautifully resembles the keel of a ship, or in shape like a long-boat,—tipped with a short, little sharp point; these clumsy leaves are set abruptly against, and half-clasping the stem, arranged in opposite pairs, alternately crossing each other at right angles. The flowers are from the ends of the branches and set low in the fork of the terminal pair of leaves. They are of a very beautiful, brilliant hue, "like crimson light, shining through transparent purple"—one to two inches in diameter, composed of several rows of numberless long linear petals, inserted into or springing from the green calyx, as do also the innumerable yellow stamens that adorn the top of this turban-like seed-vessel; the fruit, when young, is two-edged; afterward swelled, elliptic, fig-shaped (hence the common Mexican name is "*Tunita*," or little-fig). Its size is from one-half to one inch in length, by one-half to three-fourths of an inch in breadth, with a flat top or disc, having about eight coiled, or recurved central threads or styles, and marked by eight radiated fissures, which open as the fruit dries. The calyx-cup is four or five-cleft, irregular, the two largest divisions corresponding with its angles; the others have membranous margins, the whole keel-pointed like the leaves.

The inner pulp of the fruit that envelops the seeds, when ripe, is very juicy, mucilaginous and pleasantly flavored—divested of the fleshy calyx, it is eaten with sugar and cream, and constitutes a luxurious dish. The whole plant is saline, astringent, emollient, and nutritious. The Indians also use it for food.

This plant blooms nearly the entire year, and is transplanted as a box-plant by our citizens, in whose eyes the splendor of the flower makes ample amends for its gross, unwieldly foliage.

A. Kellogg.

Note.—We give the above description from our California correspondent, not because we regard his plant as a new species, but because it is interesting to find it in its new locality. Notwithstanding some discrepancies in the characters, we are inclined to recognize it as the *M. Æquilatirale* of Haworth; an Australian plant of some years' standing in the catalogues. We think it has not been before observed on this continent. There being already over 340 species of Mesembryanthemum described, we look to see the list reduced, rather than enlarged. The addition of any new species with decidedly original characters, is scarcely to be expected; indeed, it may be questioned, whether many of the characters now regarded as specific, are not rather indicative of a sportive tendency, only important as marks of subspecies or casual varieties.

Some Notes on Rare Plants.

BY WM. R. PRINCE.

Kadsura Japonica; hardy; a beautiful climber, with laurel like foliage, blooming in August; flowers yellow, with a crimson center.

Pinus lanceolata, Chinese Lance-leaved Pine; perfectly hardy; beautiful foliage, of rather a glaucous hue.

Pinus nivea, or Silvery Pine; hardy; an oriental species of the *Strobus* family, and assimilating much to the Weymouth Pine of our own country, but very distinct in its foliage.

Ilex Japonica latifolia, and *Ilex Tarago,* both of Japan, are perfectly hardy, with remarkably beautiful foliage and of vigorous growth.

Ilex balearica or Balearic Holly; hardy; very beautiful dark-green luxuriant foliage, and grows with vigor.

Pyrus Japonica, Cydonia Japonica; eleven varieties of distinct colors, all of equally easy culture with the common varieties.

Stranvæsia glaucescens; hardy; a neat shrub, with foliage resembling the Chinese Quince.

Thuya aurea, Golden Arbor Vitæ, believed to be a native of Japan; the foliage in the spring has a beautiful golden hue, and it is then of most striking appearance and very distinct from all other evergreens.

Grass and Cabbages.

It is no insignificant testimony to the kindness and providence of God, that, go where you will, you find Grass and Cabbages. Where they are, cattle and man are sure of food.

With the tribe of Grasses we shall not deal upon the present occasion, but we will bear testimony that in no latitude where man can live does the Cabbage refuse to bear him company. This fact seems to have struck the Roman poet, for he sings of

> "That herb, which o'er the whole terrestrial globe
> Doth flourish, and in great abundance yields
> Alike to plebeian and to haughty king
> In winter, Cabbage, and green sprouts in spring."*

* ————— "toto quæ plurima terræ
Orbe virens pariter plebi, regique superbo
Frigoribus caules, et veri cymata mittet."
Columella, x, 127.

Navigators and travelers, since Columella wrote, have found another quarter of the world, and have explored regions untrodden in his days; yet, go where they will, there is the Cabbage. Wild, as well as cultivated, there it is—no latitude of the tropics is so hot, no arctic region so cold, no mountain ridge of the Himalaya so elevated—but, if the hut of man can rest upon it, there will the Cabbage grow by its walls.

Even in its native form the *Brassica oleracea sylvestris,* or Wild Cabbage, is spread over all Europe. *Brassica campestris,* the wild Navew, and parent of the Swedish Turnip, is found in regions whose boundaries are the Crimea and Lapland; *Brassica Chinensis,* or Chinese Cabbage, is common in the Celestial Empire; *Brassica Magellanica,* abounds in the inhospitable climate of Cape Horn; even the isolated island of St. Helena has its *Brassica Helleniana;* Africa has its *Brassica lyrata,* and North America has its *Brassica Washitana.* Nor are these merely untamable species. M. de Serra, writing of that last named, says—"The Americans settled on the Washita River, and in the Arkansas territory, as well as the travelers who have visited those countries, speak in terms of commendation of a species of Wild Cabbage, which grows plentifully in those countries, and produces red flowers. Muhlenberg, the famous American botanist, in his 'Catalogue of North American Plants,' page 61, has given to it the name of *Brassica Washitana.* I wish the Horticultural Society would attempt the introduction and *civilization* of this vegetable. From the effects produced by cultivation in other plants of this family, we may expect, in a short period, a number of varieties, and some of them, probably, very valuable."

As the Cabbage is a native of the whole globe, so we may conclude it has been known throughout all time, for the earliest writers mention it with applause. Even the Talmudists dwell upon it under its Hebrew name, *Caruv,* and with the Greeks the *Crambe,* or Cabbage, was in universal request as one of the most wholesome of vegetables. Their physicians, such as Chrysippus and Dieuches, wrote volumes upon its merits, and from birthday festivals it was never absent. Thus

Epiphippus tells of some of the delicacies then prepared:

————"Toasted Chersonesian cheese,
And Coleworts tied in bundles seeth'd in oil."

Indeed, so high was the regard for this product of the garden, that it was dedicated to some of their deities; and Athenæus says the Ionians swore by "the Sacred Cabbage!" Passing onward, in course of time we find that the Romans had the same high regard for this vegetable; and Cato dates the decline of the Roman Empire, and the degeneracy of its sons, from the time when they ceased to have the Cabbage as a chief dish of their repasts, and displaced it for foreign luxuries.

We have in their volumes abundance of instruction for its cultivation, but we shall make only this one extract from Columella—"The Cabbage should be transplanted when it has six leaves, and when inserted should have its root daubed over with liquid dung, and then be wrapped round with three small bandages of sea-weed. Such treatment renders the produce tender when boiled, and preserves the green color without the employment of soda. When once the plants are rooted, the oftener they are hoed and manured the better they thrive, and the more luxuriant they become."

The above epitome of Cabbage-culture, as practiced about eighteen hundred years ago, is that which may be accepted as the epitome of that adopted by the best kitchen gardeners now, and we have extracted it for the purpose of adding—what will surprise many of our readers—very few persons know what a really good Cabbage is.

A Cabbage of the *Nonpareil*, or other superior variety, sown about the 10th of August, planted out during moist weather in October, amply supplied with liquid-manure in the seed-bed and in early spring; sown and grown upon a rich, light soil, frequently hoed, and well-manured with decayed dung, and an occasional sprinkling of salt, unless growing near the sea-side, or unless the surface of the bed can be covered thinly with sea-weed;—a Cabbage thus grown luxuriantly, and without a check, and uncut until within ten minutes of being consigned to its seething, is unknown to few. It is as unlike the sticky, stunted indigestibles usually found in a country garden, or to the flabby, bruised, semi-putrescent masses of a metropolitan market, as "Hyperion to a Satyr;" and we recommend to all our readers, by attending to what we have said, to surprise themselves with a hitherto-neglected luxury. It is no theoretical matter, for we know where such Cabbages were grown last spring; and their cultivator, in answer to the query, "How did you grow this *real* Vegetable Marrow?" replied—"They never knew what it was to stand still—muck and moisture kept them always growing." We can add our testimony that "muck and moisture" are the magic ingredients of Cabbage culture.

Cott. Gard.

The Food of Plants.

Vast progress is now manifested in the discoveries made in the science of chemico-physiology. The direction once given to scientific investigation seems likely soon to be productive of amazing results. Step by step great advances are being realized, and the theory and rationale of all the physical sciences involved in cultivation—and which are not?—are being more and more clearly understood.

Sir Humphrey Davy, some thirty-eight years ago, showed—though himself of opinion that the food of plants passed mainly, if not entirely, through their roots—that the vapor of decomposing dung had a greatly invigorating influence on plants in their natural state. Liebig following, demonstrated that plants took up carbon from the atmosphere in the shape of carbonic acid gas diffused through the air in which they were enveloped; and subsequently he showed that ammonia also existed in rain-water, and was brought down by it in very uniform and appreciable quantities. Fresenius, in his work published in German about three years ago—and which, we much regret, has not yet been translated, though we think Messrs. Longman announced such an edition—proved that certainly sulphur existed in the atmosphere, and phosphorus, the one as sulphureted and the other as phosphoreted hydrogen; and, more recently still, the French chemist, Barrel, found not only nitrogen and nitric acid in rain-water, in the vicinity of Paris, with the ammonia before detected, but chlorine, lime, and magnesia. Here, therefore, is a source of supply of the cultivated crops which is nearly equal to an ordinary produce, and obtained from, and brought down by, rain-water alone. Now, when we reflect that the mineral portion of our culti-

vated crops amounts to little more than two hundred to three hundred pounds per acre, we see no great difficulty in assuming that if the soil were in a proper position to retain the materials brought down by the rain, there might be enough, at least, to supply some cultivated crops with all their elements, and all kinds of culture with some of their constituents. The claying of an open and porous sand or gravel will do for it all chemically what its openness to admit the oxygen will do for it mechanically; and the deepening of this retaining and previous medium will just increase the chances of the greater detention.

And if all are not supplied, the plant becomes a transmuting agency, which can substitute lime for magnesia, and, probably, soda for potash when these are deficient. A writer in the *Transactions of the American Agricultural Association*, says: "There exists an unquestionable isomorphism among many of the mineral bodies, thus—potash, soda, oxide of ammonium, and hydrate of lime; lime and magnesia; sesqui-oxide of iron, sesqui-oxide of manganese and alumina; sulphuric and selenic acids; phosphoric and arsenic acids, are respectively isomorphous groups. Hence, soda may replace potash; hydrate of lime may be present in place of either soda or potash. That this displacement or substitution does occur in nature is abundantly proved. Thus soda has been found to replace the potash of the oak in Long-Island, on the sea coast. Marine plants, as the Salsolas, transplanted to an inland situation, are found to contain potash. Tobaccos from various sources, analyzed by Berthier, yielded potash as a base, while specimens examined by Fresenius and Will, yielded sixty per cent of lime and magnesia salts." But the cultivator wishes to stimulate parts of a plant. The tuber of the potato has been stimulated till its other fruit, —the "apple"—has disappeared from all our fields, and has become now a rare product. We cultivate the bulb of the turnip —the seed of the wheat; and these parts require varying quantities of different materials. Again, "The different parts of the same plant yield an excess of dissimilar salts: the potato tuber contains eighty-six per cent. of potash salts—the top sixty-one per cent. of lime salts. In the same way, the roots, foliage, and seeds of other plants give indications of an affinity for different minerals. Hence it follows that analysis will differ with the nature of the soil on which the plant has been produced, and with the part examined, or, if every portion be examined, with the part used in excess. As it is usual to publish the mere analysis without designating the soil, or variety of the plant, it is necessary, in arriving at trustworthy conclusions, to look somewhat further than this. Therefore, in reaching my position, I have kept in view two points—the natural habitat of the plant, and the circumstances under which its produce becomes of great excellence. Thus in the analysis of the onion, by Fourcroy and Vauquelin, lime salts predominate; Cadet found sixty-four per cent. of potash salts in the garlic; but I venture to place the family to which the onion belongs (Asphodeleæ) among the soda plants, because it is well known that asparagus, many kinds of onion, and other genera, are indigenous to the sea-coast and salt marshes, and because the Spanish onion, which excels all others, is cultivated in lands irrigated by salt-water. Cruciferous plants are soda plants characterized by a remarkable affinity for sulphur; yet in the analysis of the ashes of turnips and cabbages, they appear to be potash plants, that base acting as a substitute; I arrive at the conclusion that they prefer soda, from the fact that cabbages and many other cruciferous plants delight in situations near the sea-shore. A gentleman well known to this association has recently shown that the grapes cultivated near the low salt plains of New Jersey contain soda instead of potash salts, and are, in consequence, of a very inferior flavor. Another interesting case of the influence of the bases on the flavor of plants exists in the case of tobacco. The French government agents, finding that the tobaccos from the United States had become decidedly inferior to the old samples, submitted specimens to the examination of M. Pelouze, who ascertained that lime salts predominated in the inferior specimens in the place of the potash salts obtained by Berthier." The agriculturist, however, must not depend on the atmosphere alone when he cultivates a part of a plant, requiring more of any given element than the atmosphere will supply to a soil, how capable soever it may be of retaining manure. Barley, for instance, contains eight per cent. of soda, while its straw presents little more than one-half per cent. Wheat contains nine per cent. of that material, while its straw affords only a trace. An acre of wheat will remove fifteen pounds of phosphoric acid from the soil, while five and a half pounds will suffice for the straw. An acre of barley will carry away nearly twenty-one pounds of phosphoric acid, while its straw will not remove more than five pounds.

This accounts for the fact of which farmers often complain, that they can get plenty of straw but very little corn. One man declares that his turnips are "all top," who has probably a soil deficient in potash, for the top requires but twenty-eight per cent., while the bulb requires forty-one per cent. The

case is still more exaggerated when potatos are taken by the acre. The tubers of an acre of potatos will carry off two hundred and twenty-two and a half pounds of potash, while the tops require only fifty pounds. Hence, if all the manure necessary to a crop of potato tops is present, and the potash is deficient, and not fully supplied with its chemical substitute, we may expect to see large and vigorous tops and small, deficient tubers. The transatlantic authority above quoted gives a valuable list in a table, which we have taken the liberty of adapting to our more advanced knowledge:

Plants requiring much azote in the soil.	Seed bearing,	Lime,	Hempseed, cotton, hop, cultivated peas.
		Potash,	Corn, madia, wheat, rice, oats, barley.
		Soda with sulphur,	Rapeseed, colza, mustard-seed, linseed.
	Foliage or root crops.	Lime,	Tobacco, potatos, hemp, indigo, madder.
		Potash,	Sugar-cane, carrots, parsnips, mangold-wurtzel. beets, spinach.
		Phosp'rus and soda with sulp.	Turnips' kohl-rabi, ruta baga, cabbages, onions, asparagus.
Plants requiring little or no azote in the soil.	Seed bearing,	Lime,	Field-beans, pindars, vetches.
		Potash,	Rye, German & Polish millet, buckwheat.
	Foliage or root crops.	Lime,	Pomaceous fruits, lupines for following clovers, spurry, tares, lucerne, sainfoin, all cut before seed.
		Potash,	Meadow grasses, Jerusalem artichoke.

The table presents the groups of plants to be employed in rotation, which are variously exhausting of saline matters, and exhausting or ameliorating as respects azote.

While new discoveries are going on as to the amount of the elements of plants present in the atmosphere, it is remarkable how others are constantly made of their being in the soil in unsuspected quantities. The atmospheric chemists, as opposed to the root-absorbing advocates, are vieing with each other to make their theories sustainable by facts, and probably the result will be that both are partially right, and both somewhat too one-sided in their respective hypotheses.

The real truth is, that plants take in food both from their leaves and their roots, and derive it both from the soil and from the atmosphere, but what proportion of each is as yet by no means settled. Liebig astonished the world by showing that a soil contained more ammonia than was necessary to supply any one crop, making it evident that the whole of the materials in a soil were not available to the plant. Nor can this depend, as far as ammonia goes, at least, on its degree of fixation. *Theory* shows that a clay soil will detain equally the ammonia passed through it in solution, whether as a fickle carbonate, or a more stable and less volatile muriate, or even sulphate; and *practice* also confirms the fact that the one is just about as effective in producing a crop as the other.

But it seems certain that, whether the roots or the leaves, or both, are the main appropriating apparatus of plants, the materials required must be brought within their influence. Much as the roots of plants may ramify, it seems clear that their fine filaments do not altogether pervade the soil, and therefore there are parts where the roots can have no influence. On the other hand, it is abundantly clear that the most favorable of manures may be applied in a state by far too concentrated to be of service. We well remember how we were personally disappointed in the first cargo of guano ever imported into Hull. So minute a portion must, we thought, be drilled religiously close to the seed. We drilled it for Swede turnips with the seed. It killed 90 per cent. of the seed; and though the odd plants which came up were a sickly and stunted effort at vegetation at first, they certainly ultimately became highly luxuriant. Between the two extremes of too great concentration and too minute diffusion, some proper medium must be found in the practical application of all classes of fertilizers; and between the same extremes of diffusion and concentration the natural fertility of the soil ought to be kept. M. Boussingault, along with M. Lewry, has made some recent experiments to test the quantity of carbonic acid present in soil. That it is soluble in water, and in that state carried out of the atmosphere—that it is given off by all kinds of decay in the soil—that it is forced into the soil from the nostrils of the sheep and cattle, who feed close to the surface of the ground—is what we have always believed, and often stated.

He detects it in his *favorite soil;* the grand medium, in his estimation, of conveying food to plants. In one French hectare (about two acres and a half English) of arable land manured during a year, and taking the depth of a soil at thirty-five centimetres, (about fourteen inches English) he found there was as much carbonic-acid gas as is contained in 18,000 cubic yards of the air of the atmosphere. Thus, reckoning the proportion of carbonic-acid gas in that bulk of the atmosphere as from four to fourteen ten-thousandth parts of its volume, in the air of a hectare of arable land *recently* manured, as much carbonic-acid gas would be found as would be contained in 200,000 cubic yards of the air of the atmosphere. Then in the loam subsoil of a forest to the depth of thirty-five centimetres, the confined air contains carbonic-acid gas, equal to that in 5,000 cubic yards of atmospheric air.

The three conditions of soil indicated, are, as we take them:—1. Soil to which manure has been some time applied, as indicative of

the power of a soil to hold and retain that important constituent of plants. 2. Soil which has received a fresh supply of manure, showing the capability of manure, as conveying carbonic acid gas to the roots of the plants, equal to a very large supply of that of the atmosphere; and, 3. Soil in which carbonic acid gas has simply accumulated by the mere operation of natural decay alone.

Enough, we think, has been made out to show that, whatever the atmosphere may contain and convey, the roots are supplied with a very abundant quantity of the important element of the turnip plant—to wit, from that substance existing in the soil.

Late writers have forgotten the Decandollean theory of radile exudation. The researches of the Highland and Agricultural Society of Scotland, though too tedious to take as a whole, ought not, as far as their results go, to be forgotten. The following were their conclusions, deduced from experimental researches on the radical excretions of plants:—

1st. That the commonly cultivated plants of the natural orders, graminæ, leguminosæ, and cruciferæ, excrete by their roots soluble matter.

2d. That the excretions consist of both organic and inorganic matters.

3d. That the organic portion principally consists of oxygen, hydrogen, and carbon, existing as gum, and mucilage, and in some plants, also of a volatile matter, or oil, possessing the odor of the plant from which the excretion is obtained.

4th. That the inorganic matter consists of saline and earthy salts, having an alkaline reaction, and containing lime, sulphuric acid, and chlorine, with potash or soda.

5th. That the quantity of excretion thrown off by any single plant is very small, and excretion can only be satisfactorily examined when collected from a number of plants.

6th. That plants having large and spongy extremities to their roots, yield more excretion than plants which have slender, threadlike roots.

7th. That the excreted matter is similar in its composition and reaction, with tests, to the sap of the plants from which the excretion is obtained.

8th. That the probable cause of excretion from the roots of plants, depends on an exosmose action, which goes on simultaneously with the absorption of water and saline matter, by the spongioles of the roots.

9th. That plants absorb metallic salts when in solution in water, and that they quickly die unless the solutions are very largely diluted.

10th. That the salts of barytes are equally injurious to vegetables when taken into their texture, as the metallic salts; but that those of strontia, lime, magnesia, and the alkalies, do not act as poison unless the solutions are comparatively strong.

11th. That plants, after the absorption of metallic salts by their roots, excrete in some instances traces of them; but they are more generally decomposed in the structure of the plant, and retained.

12th. That seeds impregnated with poisonous substances, may germinate, if the quantity of the poison be very minute, but in most cases the seeds perish.

13th. That plants are not injured by their excretion being re-absorbed into their structure, as was supposed by M. de Candolle.

14th. That the necessity for a rotation of crops arises from the soil, in most instances, being unable to supply those earthy and saline constituents required by plants.

These views seem to have been, of late, entirely overlooked; but, though we cannot follow the misty theories of De Candolle, still we would make all proper allowances for his extreme views, and confess that there is something in the general principle which will one day tell on the art of cultivation. The American Transactions above referred to, thus speak on the supply of root food. Under natural circumstances, all the grain-bearing plants require little azotized matter; but from the development which many, such as wheat and barley, have acquired, they have become azotized plants, and are not to be maintained in their present state without a large supply of this food made to the roots. Many garden vegetables are also of this kind.

Working Farmer.

California Sugar-Plants.

The alluvial lands of the Colorado are highly fertile—vegetation rapid—the products of the soil which contain saccharine matter, are furnished in a greater proportion than is usually found in other places. From the bark of a small hard reed, the Indians procure sugar. Many varieties of bulbous roots contain a large proportion of sugar. Honey dews are frequent and abundant. I have seen willow groves cut down by the Indians, for the purpose of obtaining the boughs and leaves, which they wash in water, and then by boiling, or evaporating the water, procure a sweet and pleasant sirup. The mescal, "Agave Americana," for two or three months of the year, furnishes the natives with a sweet and nutritious food. The mesquite, a variety of the Melianthus, produces a bean in great abundance, from which they prepare a sweet and palatable flour. The pumpkins and melons grown upon the banks of the river are very superior, and marked for flavor and sweetness.—*The Pacific.*

Heating Small Greenhouses.

If we were asked to specify the difficulty in gardening upon which we have most frequently been asked to advise, our reply would be—Upon the most desirable mode of heating a small greenhouse. The causes of this difficulty are various. Hot water apparatus is expensive; flues take up much room; both are difficult to temper, so as not to overheat a very small structure, and the fire of either requires constant attention, to say nothing about the dirt and trouble of lighting and relighting. Where there is a gardener, and no deficiency of assistance, all this is mere matter of customary routine and seasonable duty, but they are grave difficulties, and almost worse than counterbalancing the pleasure derived from a greenhouse, by an amateur of limited means, upon whose own skill, or that of the lady of the house, its management devolves.

Last autumn, a principal tradesman in Winchester, applied to us for advice upon this very point, and we recommended him to have a small hot-water apparatus heated by gas. As the expense is not an object to him, he has had the apparatus constructed of copper.

About the same time, we think, a similar idea suggested itself to Mr. Cuthill, of Camberwell, for he communicated the plan to the London Horticultural Society, at its last meeting.

Strangely enough, and as if there were certain thoughts had a vagrant habit, and found a resting-place in various brains as they journeyed on, Mr. Arthur Paine, wine-merchant, at Tiverton, also, in last autumn, constructed a similar apparatus. To him belongs the greatest merit, however, for he at once embodied the thought, and in the apparatus, of which we subjoin his drawing and description, little room remains for improvement. The only suggestion we have to make, is that a funnel be attached to a tube long enough to reach to near the bottom of the boiler, and that care be taken that a little water can be always seen in the funnel.

Mr. Paine says:—"I have great pleasure in answering your questions, and am sure, should any of your readers try this means of keeping out frost, they will find it succeed beyond expectation.

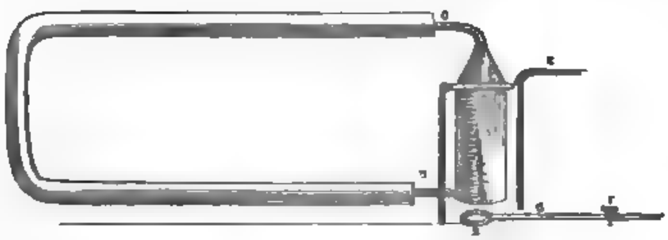
"Mine, it is true, is on a very small scale, but I have no doubt it is equally adapted for buildings of a larger size, provided the gas-burner is increased in proportion.

"The boiler is placed inside the house, so that all the heat from the gas and the boiler itself, may be made useful.

"It is inclosed three-quarters up with slate and mortar, so as to allow the heat to ply all round it. I have had it in use since September.

"One-inch lead-pipes are used to attach the boiler to the iron-pipes, on account of being more easily fixed to the boiler than the three-inch iron ones. I should here observe, that I have proved the lead-pipes will not give the same amount of heat as the iron. I have twelve jets of gas in the ring beneath the boiler. The holes being pierced with the smallest drill.

"During all the severe weather in February, and without putting on mats, it maintained a temperature above 45° in a house ten feet long, and seven feet wide."



A Three-quart tin boiler.
B Ring gas burner; twelve small jets.
C Flow-pipe (iron) three inches.
D Return do.
E Pipe conducting consumed gas outside of house, one-inch.
F Gas tap.
G Communication from outside of house, to light gas.

Remarks.—When gas is at hand, as in our cities, it is to be preferred on many accounts, but where it cannot be had, a small furnace will be required. This may be constructed upon the usual plans, or it may consist of a common coal stove, with the boiler so situated as to receive the direct influence of the coals. By using slack coal and cinders, and by turning the damper, at bed-time, the requisite temperature can be readily controlled, especially, if mats or shutters be applied, in very severe weather, as the hot water pipes retain their temperature a long time. Dr. Shaler, of Newport, Ky., adopted a similar arrangement, with success, some years since, in a small greenhouse.—J. A. W.

Distribution of Plants.

BY M. J. SCHLEIDEN, M.D.

Of all the influences of mankind upon the vegetable world, one of the most beneficial is, without doubt, the conversion which he has effected of the wild and often almost inedible plants into the delicious ornaments of our table. Even if the Apple, Pear and Cherry trees were originally peculiar species, and have not been produced by gradual improvement from the Crab and the Wild Pear and Cherry, there are still enough plants remaining to prove what great power the art of Man has here exercised over Nature. What resemblance has the Cauliflower, the Savoy, or the Kohl-rabi, to the dry and nauseous, bitter-flavored Colewort, which is undoubtedly the parent of our delicious vegetables, since we can readily convert these again into it by allowing them to run wild. Who, from the comparison of the saccharine, delicate, orange-colored Carrot, with the woody spindle of the root of the wild Carrot, would believe that they belong to one and the same species?—and still it is the case. In short, Man can here essentially interfere to alter, in the development of individual natural bodies, and as he can obtain from the sanguinary beast of prey, from the Wild dog, the playful spaniel, the useful hunting companion and the rescuing St. Bernard's dog, or from any rugged sheep the precious Merino-lamb, so in the world of plants he can elevate the Useless which Nature has given him, into an object worthy of his cultivation.

The changes which Man has caused in the distribution of vegetables cannot appear so important as the above interferences. But it is only what we expect, when we find that the Economic and Food plants follow Man everywhere, where the climatal conditions of their growth are met with. These wanderings of plants are arranged and carried out by Man intentionally. But in the rear of these armies of plants, like the rabble of marauders and thieves following a great human army, a number of other plants are inseparable followers, which Man, when he takes one wild plant, must, as it were, receive as an addition to his bargain; I mean the weeds. It may safely be asserted, that a portion of our field plants which are never found anywhere with us but among certain definite crops, are not indigenous, but introduced along with the seed among which they are met with. Among such unbidden guests may be enumerated the lowly Pheasant's-eye, the Blue-bottle, the Corn-cockle, the Field poppy (*P. argemone*), the Larkspur (*D. consolida*,) the *Lolium linicola*, the Hemp, and many others.

In a still higher degree, spontaneously, and without the conscious co-operation of Man, a certain number of plants attach themselves to the Lord of Creation, and follow him whithersoever he goes, wheresoever upon the earth he takes up his abode; not in company with the cultivated plants he has brought with him, but in his immediate vicinity, settling round his barns, his stables, or on manure and compost heaps. It is more than probable that the different great families of Nations may be distinguished through this circumstance, and from the weeds which have firmly attached themselves to their train, it may with some certainty be determined, whether Sclaves or Germans, Europeans or Orientals, Negroes or Indians, formerly built their huts on any spot. Thus, even to the present day, are marked the footsteps of the bands of nations which in the middle ages emerged from Asia into Central Europe, by the advance of the Asiatic Steppe-plants, such as the *Kochia** and the Tartar Sea-Kale,† the former into Bohemia and Carniola, the latter into Hungary and Moravia. The North American Savage significantly calls our Plantain, or Roadweed,‡ "the Footstep of the Whites;" and a common species of Vetch§ still marks the former abode of the Norwegian colonists in Greenland. A more intimate knowledge of these peculiar Floras might probably afford us many more interesting explanations as to the wanderings of the primary Races of mankind, and their alliances, if so many botanical travelers were not so-called Systematists—that is, dull and ignorant collectors of hay. I may mention some more of such examples, vegetables especially accompanying Europeans, the different kinds of Nettle and Goose-foot. But one of the most striking instances of the kind is the gradual extension of the Thorn-apple over the whole of Europe, which has followed the bands of Gipsies out of Asia; this race make frequent use of this poisonous plant in their unlawful proceedings, and hence much cultivated by them, it also occurs, uncalled for, near the places where they have made their habitations. Auguste St. Hilaire says, in the introduction to his Flora of Brazil, "In Brazil, as in Europe, certain plants appear to follow in the footsteps of Man, and preserve the traces of his presence; frequently have they helped me to discover the situation of a ruined hut, in the midst of the wastes which extend out beyond Paracuta. Nowhere have the European plants multiplied in such abundance as in the plains between Theresia and Monte Video, and from this city to the Rio Negro. Already have the Violet, the Borage, some Geraniums, the Fennel, and others, settled in the vicinity of Sta. Theresia. Everywhere are found our

* Kochia scoparia.
† Crambe tatarica.
‡ Plantago major.
§ Vicia cracca.

Mallows and Chamomiles; our Milk-thistle, but above all our Artichokes, which introduced into the plains of the Rio de la Plata and the Uruguay, now clothe immeasurable tracts, and render them useless for pasture." After the War of Deliverance, in many places where the Cossacks had encamped, was found the Tick-seed,* a plant allied to the Goosefoots, which is quite exclusively indigenous in the steppes on the Dnieper; and in a similar manner was the *Bunias orientale* spread with the Russian hosts, in 1814, through Germany, even to Paris.

But such wanderings of plants also occur altogether without the co-operation of mankind. The Seychelles Nut† is driven by the ocean currents on to the shores of the Maldives, and there germinates in the sand. The earliest settlers in the Coral Islands, newly arisen in the silent ocean, are the Cocoa Palm and the Pandanese or Screw-pines, the fruit of which, protected by a hard shell, is found everywhere drifting on those seas. Rivers carry the seeds from the higher regions down into the lowlands, and thus, numerous forms which were originally peculiar to the higher mountains are distributed on the banks of the Alpine streams of southern Germany, in Bavaria and Wirtemberg. Man also unintentionally gives the first impulse to such wanderings, which the plant then independently continues. Thus has the Sweet-flag spread all over Europe, which was originally brought from India and raised in some Botanic Gardens. The Indian Fig and the American Agave have, in running wild, essentially changed the physiognomy of the landscape in southern Spain, Italy and Sicily. In the middle of the 17th century a seed of *Erigeron canadense* came to Europe in a stuffed bird, was sown, and the plant is now distributed throughout Europe, in places to which it has never been conveyed by Man. The structure of seeds and fruits which facilitates their being driven far and wide by the wind, the voracity of birds, which devour the indigestible seeds, then afterward often germinating far distant from the mother-plants in the excrement of the bird, and similar circumstances, explain this free distribution of plants.

Bark Louse.

Even in the thrifty young orchards of the Illinois prairies, this pest has commenced its troublesome depredations. Knowing the effect of potash upon the Coccus of the Oleander, I advised dusting on ashes after a rain. In a report of the Entomological Committee to the Pennsylvania Horticultural Society, is the following description:

A species of Coccus, or Scale Insect, of the Apple-tree; a noxious Bark Louse, which injures the tree by sucking the juices from the branches to which it is permanently attached. They are of a brown color, about one-tenth of an inch in length, of an oblong oval form, and gregarious in their habits. When they are crowded together in great numbers, on the limbs and branches, as is often the case, the growth of the tree is materially impaired, and its life endangered. Dr. T. W. Harris, in his able "Report on the insects of Massachusetts injurious to vegetation," recommends, as the best remedy for its destruction, "a wash made of two parts of soap and eight of water, with which is to be mixed lime enough to bring it to the consistence of thick whitewash." The application is to be put on with a brush, to the limbs affected, "in the early part of June, when the insects are young and tender." We have also used with entire success, in the winter, the whale-oil soap, applied with a hard brush.

Sulphur Cure.

Mildew is one of the greatest pests of greenhouses and all sorts of plant structures. The following remedy has been tried in the houses of the London Horticultural Society, and has been found efficacious: Sulphur and unslacked lime are put into a tub of water, in which they are quickly and intimately mixed, and the trees and plants syringed with the clear liquid, after these substances have settled at the bottom. This liquid consists of a solution of the hydro-sulphate of lime, and its decomposition gives off an offensive exhalation which is noxious to the fungi constituting *mildew*. Insects are also repelled by this substance, and its application has attained quite a reputation as a preventive of the curculio; whether it will prove *the remedy*, and take the premiums offered for a means of preventing the ravages of this pest, remains to be proven. The application of lime and sulphur is sometimes made in a dry state, and others recommend using the mixture in a muddy state, so as to apply the undissolved ingredients, as well as the solution of the newly formed salt. Further experiments will develop the relative value of these different methods.

* Corispermum Marschallii.
† Lodoicea sechellarum.

Editor's Bureau.

New Year's Address.

To the Reader.

It is with emotions of peculiar pleasure that I now embrace the opportunity of again appearing before the Horticultural readers of the country—to whom for three years past, I have been in the habit of addressing myself every month, through this medium—with the compliments of the season, begging them to bear patiently a recital of the details of anticipations we mean to realize, a few of which shall now be laid before the readers of this Number of the *New Series*.

To a large number of the ardent friends of Horticulture, who, through the agreeable intercourse which has been kept up between us for some time, have also become warm personal friends of the Editor, including many whom he has never met face to face, the announcement of the resumed publication of this Monthly visitor, will be hailed with pleasure. This assumption, it is hoped, no one will consider an empty boast; the constantly repeated assurances of kind friends, personally and by letters, received from every quarter, are sufficient evidences that this Periodical is needed.

The work addresses itself to every lover of Fruits, Flowers and Rural affairs, whether as a producer or simply as a consumer, enjoying the sweets resulting from others' toil and skill. To those who cultivate the soil for the products of Flora, in the most modest way, be it even within the narrow confines of a flower-pot, these pages will address themselves—to the larger cultivator, in a corresponding ratio. To every person who sets a single tree, for fruit, or for ornament and shade, here is something offered, as to Planting, Trimming, or other treatment. The Garden, in all its departments, will be so brought before those interested and occupied in its care, that they shall feel they have received at least some useful hint. The Vigneron, whether he who surveys his acres with purple clusters crowned, upon our fertile hills, or he who lounges beneath his extended bowers of refreshing shade in sunnier climes, where the Scuppernong luxuriates, or even he who carefully trains a single vine against his humble cottage, to guard it from the chill blasts of a northern winter, shall here find words of value, and will not seek in vain for needful information. The important interests of the Orchardist, shall be considered, and it is believed, will be very much advanced by the attention that will be paid to the agreeable science of Pomology, which of late years, has deservedly attracted much attention, and must still continue to occupy its devotees, until several problems respecting the growing of fruits shall have been satisfactorily demonstrated.

To the mere Farmer, who glories in his broad crops and lowing kine, as well as to the retired Citizen, who for years, has struggled with the rushing tide of city life, until he gladly escapes to the quiet country, or suburban village to realize his childhood's impressions and life-long dreams of sylvan joy—to every lover of Nature, of the Rural, and the Gardenesque, here will something be afforded, worthy of serious attention and quiet investigation; while to him who may be only looking toward the country, the details of Rural Architecture, as illustrated by Plans and Descriptions, are offered to aid his designs in constructing his future paradise, and to assist him in forming his arrangements. For those who assume to be perfectly indifferent to the *actual* in country, and in country life, but who have the innate love of nature still existing in their souls, not yet choked up by unhappy surroundings—here will be found Botanical disquisitions, and other papers of interest.

Great questions not unfrequently arise, which must be discussed in a journal like this, which may not attract the general reader, and which may be considered by such, as of little moment, but which, if properly investigated, often settle principles of the greatest importance. Horti-

culture is becoming a science, as well as an art, and therefore a higher art than ever before—and is already indebted to many kindred sciences for much of her boasted advance. To Chemistry, to Meteorology, to Physics, to Geology, to Entomology, and especially to Botany, in its most extended sense, is the gardener already placed under large obligations—to his further indebtedness to the allied sciences, it will be safe only to allude, though a prophetic eye is not needed to perceive that it will go on in an increasing ratio, as the operatic and the theoretic are brought into nearer and closer sympathy. For this consummation of the happy results that must ensue, from the closer and more intimate sympathy between the æsthetic and the real, be it ours to aid in accomplishing!

The former commencement of the book year of this periodical, was regulated by events occurring at the period of its being first ushered into the world; this year, like an epicycle, continued its evolutions, but as it did not correspond with the accepted calendar, it was thought best, at the close of the Third volume, that there should be a suspension until this period, when, after the recuperation of three months' rest, during which time the dreamy atmosphere of a delightful autumn, has been enjoyed by the Editor, upon lake and prairie, and sunny slope, amid the glories of our giant west, the work again presents itself, renewed, re-made, reorganized, and under new auspices, in such a form as must be most acceptable to the readers, and such as the Editors need not feel in the least degree ashamed to own.

In now again presenting itself a candidate for public favor, it may be well to inform the reader, that the additional services of an accomplished scholar have been secured. Mr. James W. Ward, is well known among the literati of this country, as a writer. His aid in the Botanical department, will be highly esteemed by all who are conversant with his investigations in this delightful branch of natural science. His pleasant style will prove acceptable, being freer from the angularities, and didactic bluntness of your old friend, who has ever been obliged to prepare his numbers under the exciting stimulus of whip and spur, which have not allowed him that quiet, easy, literary leisure, so congenial to the preparation of written composition, as to have become proverbially its necessary accompaniment.

Those who have heretofore been supporters and readers of this serial, will observe among many other changes and improvements in the appearance of the Number now presented to them, that the title of the work is somewhat different from that of the preceding volumes. This change has been effected after due and serious consideration—it consists in both reduction and addition to its former proportions. The first change, that of dropping the localizing term *Western*, was determined upon as a matter of justice to those who have kindly lent their support to a work, avowedly *Western*, although they reside in various parts of the country—it is also dropped, in justice to my own feelings; for though the associations of home, and particularly a home in the west, are exceedingly attractive, to a man who has witnessed the wonderful developments of human activity in this glorious region of our noble country, still I claim that as an Editor of a work like this, intended to be read by citizens of all parts of the confederacy, no sectional feeling should interfere with its usefulness, nor restrain its sentiment.

For the additional title, we may all feel ourselves indebted to the fact, that we have secured the aid and collaboration of Mr. Ward, to whose botanical knowledge your attention has already been directed.

No apology will be offered for introducing to the reader of these pages, the worthy gentleman who has stepped forward, just at the critical juncture when most needed, and has undertaken the very important and responsible duty of publishing the work. Some persons may imagine this a very light matter—they who think it an easy affair for one who has never been connected with a labor of the kind, to manage the publication of a periodical, should try the experiment to discover its difficulties and annoyances; to some they might furnish an agreeable stimulus; to others, on the con-

trary, they have proved extremely oppressive, almost crushing, and a constant source of mortification.

The mere announcement of the name of H. W. Derby, as Publisher, will be received by all as a sufficient guarantee that there will be no disappointment on the part of Subscribers, but that what he promises will be performed handsomely and well. Several improvements are made in the style and character of the work. Illustrations and embellishments will be introduced in each Number, and the whole appearance will be made more attractive. The extensive business connections possessed by the Publisher, will enable him to present the Review, to the most distant Subscribers through agents, in every city and town where the love of Horticulture has already created readers, and their activity, it is hoped, will not fail to awaken more interest in the minds of many to whom the subject may be new.

The prospects of the work, therefore, under the new régime may be considered most highly flattering—that they are so, all may feel well assured, remembering also, that this very assurance on the part of the public, is, in itself an important element of the success of the undertaking, independent of any intrinsic merits it may possess, of which, by-the-bye, it is not for me to speak.

It is proposed, in the forthcoming Numbers to commence Series of Papers upon some of the most important topics connected with the Rural arts immediately associated with Horticulture. These will constitute, in the aggregate, an invaluable collection for future reference; they will, indeed, be essays or treatises upon the several subjects—not made up with the scissors from standard works, that are in the hands of every gardener, or to be had at any bookstore—but original essays, written with great care, especially for this periodical; these courses of papers, it is confidently believed, will be of great value, as they will be prepared with diligence and care, and founded upon absolute practice. The series upon the Garden will receive early and particular attention, and will constitute an important feature—as it will embrace Preparation, Soil, and Treatment. In this connection will appear, from time to time, notices of *new plants*, and the success attending their culture, as fast as they may have been introduced into the gardens.—In this matter the reader may always bear in mind that no person associated with the Review, has any connection whatever with a Commercial garden, where plants are grown for sale. Flowers and Fruits shall have their merits and demerits freely discussed; and when they are deserving of praise, let no one fancy the notice is intended as a puff of an interested propagator of plants or trees.

The Orchard series will embrace directions and discussions upon the Soil, Situations, Planting, Culture and Treatment of different Varieties, their Diseases, and the best Manures and Remedies to be applied. Select Lists of Fruits for the Garden and Orchard, due regard being had to the locality and the objects of the planter, whether they be for market or home consumption. New Fruits will be described and figured whenever they appear worthy such distinction.

To a large class of horticultural readers throughout our country, the Vineyard series will present great attractions; even those who are earnest in the temperance cause will rejoice to learn how to cultivate the luscious Grape, from which a pure and wholesome beverage may be prepared that shall supplant the noxious mixed liquors which have possession of the public market, and for which we are obliged to pay large sums to foreign countries, or worse still, to domestic manufactories, where common spirits are transformed into villainous compounds of drugs, and sent forth as "pure wines." Or at least, the most zealous devotee cannot object to receiving instruction in the best methods of producing this delicious fruit for the Table. Long continued observations and extensive travel will enable the Editor to furnish a complete series upon the selection of Soils and Varieties; Preparation of the Ground; Planting, and especially the important matter of Trimming; all these subjects will be illustrated with fine Woodcuts, prepared especially

for the work. The different plans of managing the Vine, particularly those which have been tested in our own country, and their relative advantages for different varieties and varying situations will be pointed out to the reader.

Architecture, especially Rural architecture, and all that contributes to the picturesque in town and country, will require a Series that will appear from time to time. Original Designs will be prepared, and the different styles of Buildings will be presented and their merits discussed; details will be given and illustrated, by Ground-plans and otherwise.

Occasional Papers, more or less connected, will appear in successive numbers; these will be devoted to Landscape Gardening, in which an endeavor will be made to diffuse correct notions of good taste; they will be illustrated by ground-plans of Gardens, Walks, Parks, Modes of judicious Planting and such other matters as may be deemed desirable. In this class reference will frequently be made to Rural objects of beauty and descriptions of interesting Scenery both Artificial and Natural.

Botanical Descriptions and Discussions upon this closely allied science, and upon Vegetable Physiology, as also descriptions of Insects prejudicial to the Garden and Orchard, will form a very important feature, and will frequently be accompanied with illustrative drawings.

Reviews and Notices of Books, on suitable topics, will be furnished, and may be looked to as an index of the esteem in which they are held by those who profess to be competent to form a correct opinion upon such matters.

Transactions of Horticultural Societies, and other bodies which possess interest to the readers of a work like this, will be presented in a condensed form, so as to keep the horticultural world advised of the progress made throughout the country.

Correspondence from our friends who are engaged in the pursuit of Horticulture, will be frequent and valuable; many of those most earnestly interested in its prosecution, in various parts of the country, are already Correspondents, and will be encouraged to continue their contributions to the stock of knowledge. Those who have not yet commenced, but who have any important facts and observations to put upon record, are earnestly solicited to set about the work immediately and send in their papers to be incorporated with the facts already in hand. Descriptions of New Fruits and Flowers, with correct Drawings, are also particularly requested.

And now, my good friends and kind readers, if you have had patience to follow my prologue thus far, allow me to beg of you not to look with evil eye upon this programme of the Volume which is now commenced, nor consider it the empty boastings of a man who would attempt to carry by storm the castle of your gentle affections, in order to reap therefrom that which would contribute to his personal benefit. To my old and tried friends these words were needless, but this New Year's Address will probably pass under the review of thousands who have not known my antecedents, but who might learn from those friends, who have borne with my shortcomings during the past three years, that they have received an earnest of all that is here promised, and that my life, during that period, has been actively devoted to their interests and to the cause of Horticulture. Moreover, they might learn also that, as a natural consequence of this devotion, I have sacrificed a very enviable position in the field of a noble profession—sacrificed it in the cause, and have reaped thistles instead of the golden grain—debts in lieu of emolument. Let no one, therefore, doubt a devotion to the cause which must and shall lead to a successful issue.

Trusting that the amiable side of human nature, and the milk of kindness, rather than the critic's gall of bitterness may be presented toward this exposé of egotistic personalities, allow me again to wish you the compliments of the season, and to hope, that while your shadows may never grow less, your numbers may increase a thousand fold.

JNO. A. WARDER.

Premissory Notes.

My worthy Senior, I perceive, expects me to say a word to the Patrons of the Review, appropriate to a first appearance. Suffer me to be brief. I have only to say, that we think we have entered upon a good work. An endless study is before us: the Earth and its wonderful and beautiful products. The Field, the Garden, and the Forest; into what a boundless field of inquiry have we ventured. The origin and uses of Plants; how inviting the topic. The Earth, in obedience to the great command of Him who doeth all things well, brings forth the grass, the herb yielding seed, and the fruit-tree yielding fruit, after its kind, and Man rejoices in the comfort and sustenance and beauty they afford. But will his intelligence and curiosity go no farther than this? Will he not consider these things, so worthy the attention of his finer faculties? Their Anatomy; the Laws of their Growth and Decay; their Food; their Products; their Relations to one another, and to Man; their Culture and Improvement; is here nothing to do? Do we know all this? Are we satisfied with what we have accomplished in our endeavors to understand the Plants so intimately associated with our well-being and happiness? I hope not. Is the child a Chemist because he can distinguish between mint-drops and lemon-candy? No more is he a Botanist, who knows only the names of what grow in his fields and gardens. And yet it is something to know the names—but how much more to understand the phenomena of their constitution and development—to see into their inner growth, and comprehend their alliances and capabilities! There is more in a pumpkin than meets the eye. The ox knows it is not a turnip; and that it is an agreeable and nourishing diet. Man should know more than the ox, and may know if he will inquire.

For ourselves—with unaffected deference to the much experience of my associate—we are quite sensible of our defects, and want of knowledge. But we take courage in view of the facilities of observation that surround us. We are students, like yourselves, good readers. We shall seek to be faithful ones. We shall give you what we may learn from others, and what we shall ourselves, from time to time, observe, and think out. No earnest, true man, can be long in communication with nature, without learning something. It is only important that it be sincere and useful. It is something—very much, I think—to get free from the tyranny of opinions; to see nature constantly clarifying, unfolding, disclosing, and so correcting our knowledge. The ass's foot has muddied the spring; but if we watch, by-and-by, we shall see it all clear again, and the shells and pearls at the bottom, we may gather at our leisure. How foolish, not to have tarried the settling of the obscurities. Let us not be deceived by appearances, or customs. Your thought or habit, is not, therefore, true and best because your father or schoolmaster thought so. The father of Galileo told him the sun went round about the firm set earth. The tale answered the purposes of the child, but after awhile, he did not believe it; and much watching and thinking brought him at last to show the astonished world how the thing was done. "And what," said the Chemist, Parmentier, to the Botanist, Plumier, "What can be made of this tuber?" holding in his hand a diminutive, unpromising potato. "Nothing," said the Professor; "Nothing," said the learned societies; "Nothing," echoed the farmers. But Parmentier, next Spring, stuck his potato into the ground, and in the Fall, carried a dish of mashed potatoes and cream to Louis XVI, "Is not that *something*, Sire?" The King thought it was good; but the people, not knowing how to prepare it, still said nay. But Parmentier held out; against much opposition, planted his acres in potatoes, and distributed them everywhere, convinced that they would ultimately become the staple food of millions. And so in time, as prejudices decayed and new generations tasted and judged for themselves, they did. This experience is common. It will not do to take things too much upon trust. As the age advances, experiments, thoughts, discoveries, knowledge, advance also. And

he who adheres to the practices and theories of his grandfather, will find himself, one of these days, left behind by the forward march of improvement.

Our work is before us. To ascertain and report upon facts, new and old; to record experiments and their results; to try and come to an understanding of the phenomena and procedure of nature; to arrive, finally, at some valuable practical conclusions, interesting and instructive to the amateur, and useful to the gardener and florist. To this end—which certainly is not without promise—we look with confidence for encouragement and co-operation, from all who sympathize with the present undertaking, particularly soliciting a correspondence with the friends of observation and improvement everywhere. We expect this correspondence, and hope not to be disappointed.

The writer's connection with the Review, grows out of his recent project for a Botanical Magazine. It was thought, and perhaps wisely, that that scheme would not be able to go alone. A union with the Western Review, was proposed by several friends of both enterprises, and by the concurrence of the present Publisher, it has, at last, been effected. I shall have charge, chiefly, of its Botanical and Floral department, together with a general supervision of its business relations and responsibilities, in special connection with the Publisher.

One word more. The Review is independent. It owes no obligations to any parties or persons whatsoever. It has no sectional biases; no private interests; no pet theories to uphold; no peculiar *views* to defend;—whatsoever things are just and true; whatsoever things are commendable and of good report,—these we shall present and maintain with what ability we may. We shall probably not always be right; when wrong we shall hope to be corrected; when invidious or unjust, we shall expect to be abandoned. Till then, we shall look for "smiles and kind words," from all who in any measure, whether from interest or pleasure, concern themselves in that pleasantest pursuit of human industry—the culture of the Earth. Nature's liberality is immense—exhaustless; lend us your ear, and perhaps we may be able to show how much that liberality may be helped, with a little art and industry.

JAS. W. WARD.

Cincinnati Botanical Association.

This little Society exhibits a good design and promise, and will find opportunities for usefulness. How well it will fulfill its promise, and how energetically it will improve its opportunities, we are too intimately connected with its management to say. We hope much for it, however, and have no doubt it will be able to do something for our Western Botany, that will be worthy of future mention. The organization for the present year, is as follows:

President, JOHN A. WARDER, M. D.

Secretary and Librarian, JAS. W. WARD.

Committee of Council:

ROB'T. BUCHANAN;
JOSEPH CLARK;
G. W. KELLOGG, M. D.

A list of Corresponding Members will be given in our next number. It is hoped that the number of these will be increased; and that minutes and observations, lists and descriptions, and much else, illustrative of the varied Flora of our country, will be sent us by those who take an interest in the subject. It will be one part of the province of this department of our Monthly, to arrange, and put on record so much of the correspondence of this Association as may seem to merit the attention of our Botanical readers.

To Horticultural Societies.

Officers and members, you are respectfully solicited, and urgently requested to keep us, your best friends, fully advised of your proceedings, that we may have the pleasure of reporting the progress of the art to the world, in our pages. Secretaries are particularly solicited to transmit manuscript accounts of proceedings, or printed slips, or *marked* newspapers, to Editors' address, at as early a date as possible, for we desire to present, in each

monthly issue, a brief mention of all the activity in horticulture, which exists in our country.

Experimental Farm and Gardens.

A very neat engraving of Mr. F. G. CARY's proposed improvements at Farmer's College, near this city, has been presented. The plat is neatly executed by RICHARD DAVIES, and embraces the Park, Botanic Garden, and Experimental Departments for fruit, grains, and grapes; such an addition to this excellent institution will render it a very desirable resort for the youth of our country, who are determined to attain a practical education.

United States Agricultural Society.

This very valuable, and highly important general association, will hold its regular annual meeting at Washington, D. C., on the first Wednesday in February; when it is expected, that numbers will be present from almost every State in the Union. Such a commingling of the varied interests of all-important agriculture, cannot fail to be attended with good results. Papers will be presented upon various topics, among which that of the *Vine*, and its Culture, will weave its tendrils. The Quarterly Journal of the Society will be ready by this meeting, and under the editorial care of W. S. KING, ESQ., will do credit to him and to the Society. The supervision of the National Cattle Show, to be held at Springfield, Ohio, will probably be assumed by the officers of this organization.

Rural Architecture.

We design adding to the value of our Periodical, by a Series of Papers upon the appreciated, but too generally neglected, topic of Country Architecture. The lamented DOWNING gave a vigorous impulse to enlightened thought upon the subject, and though he may not always have led in the most promising and practical direction; though his suggestions had not always the force of originality, and the merit of simplicity and adaptation to the peculiar wants of the country—still, the good work he began; the lively interest he awakened in the general subject; the pressing urgency he claimed for its more general cultivation, and the manifest improvements that have resulted from his labors—will ever remain enduring monuments to his cultivated taste, and the earnest efforts of his life, to create a higher sentiment of the beautiful in nature and art, in the minds of his countrymen. But DOWNING made but a beginning. The good he did lives after him, but will stand where he left it, to be remembered only as a thing of the past, without renewed efforts at farther, and perhaps more efficient progress. This is not the work of one or two, but of many. We propose to lend our measure of aid, toward maintaining and developing just principles of propriety, economy, and right taste, in the adornment of our country, by appropriate and beautifully constructed Rural Dwellings. We are enabled to make this proposal with more confidence, having the promise from a gentleman of marked ability, sustained by a large and competent experience, and a long study of the many details of the subject, to prepare for our pages a series of articles illustrative of its importance, and conducive to a more general cultivation of its most essential and available principles. We shall probably make a beginning in our March number.

Obituary.

We are concerned to observe the recent death of the Botanist and Naturalist, Mr. TESCHEMACHER, of Medford, Mass. He was well known in Boston and elsewhere, for his scientific attainments, and was a frequent contributor to the pages of eastern Horticultural periodicals; as he had long made the subject of the growth and habits of plants, his daily study. He was an active member of the Massachusetts Horticultural Society, and occupied an official position in the Boston Society of Natural History. He will be regretted by many, who had not the pleasure of his personal acquaintance; for his influence extended far beyond the immediate circle of his acquaintance.

TRANSACTIONS.

Cincinnati Horticultural Society.

SINCE the last report, this organization has continued to hold its weekly meetings, which have been characterized by the pomological interest arising from the constant exhibition upon its tables of the fruits of our country, brought forward as they have been perfected. In addition to those grown in our immediate neighborhood, the members have been gratified by frequent exhibitions of fruit from other sections of country, which tend to familiarize them with the products of other regions, and also, enable the observers to note and compare the effects of soil and climate, upon many, with which they are well acquainted. Among these, the collections from Illinois and New York, have been possessed of the greatest interest, both containing many varieties that are new to our committees.

The specimens from New York always embrace some new sorts, which are eagerly studied on account of their novelty, and the members of our Society are under great obligations to the contributors in that quarter, since they are thus enabled to anticipate the fruitage of their own plantings of the new varieties, and often become thus personally introduced to varieties, of which they had before scarcely heard the names. Illinois, however, with her fertile plains, bids fair to rival even the boasted orchards of Western New York, in the production of apples; and we have this year, received numerous convincing proofs of this assertion. The specimens are remarkably fair, and well developed; then the intelligent character of the pomologists of that region, and their energy, which has induced them to organize, and sustain, in that extended and thinly-settled country, such an institution as the *North Western Fruit Growers' Association*, is sufficient guarantee that their contributions will be possessed of interest.

Already the first planted orchards of Western New York, begin to show symptoms of decay, or, at least, they manifest less of that fairness and superiority by which their fruits were at first characterized, though still an extraordinary fruit-growing region, the North-West bids fair, for a few years at least, to outstrip her in the beauty of her pomonal products; and so well satisfied are the intelligent farmers of Northern Illinois, Wisconsin, and Iowa, with the advantages of soil and climate they possess, that many are planting on a grand scale—and will be prepared in a few years to supply all demands from the East and South, to both of which they have easy access.

But to return to our own organization—the discussions upon fruit, during the Autumn and Winter, have been very interesting—beside this, we have had few topics that excited much interest. Flowers have been rare in their visits to our tables, but the November exhibition, chiefly of chrysanthemums, by Heaver, Evans & Co., attracted much admiration—the new Pompone varieties were considered exquisite gems.

The Autumnal exhibition was superior in every respect, and quite re-established the Society in the affection of the citizens, for whose comfort and enjoyment it has indeed largely contributed from its organization—ten years since. The perfection and variety of fruits of various kinds, won the praises of all, and the well grown plants and perfect flowers were vastly superior to the poor misshapen things that were formerly paraded with pride, in the days of our early horticultural efforts.

It was, however, a matter of regret, that the vegetable department should be so much slighted; the liberal premiums offered by the Society, failed to bring out the profusion of products which we have a right to expect from the kitchen garden; this should not be the case—that large body of useful citizens, who devote themselves to this important branch of horticulture, should be induced to take an interest in the Society, and to contribute to the glory of her exhibitions.

The American Wine Growers' Association.

The abundant vintage has rendered the Autumnal meetings of this Society, unusually interesting, especially when they were held among the vine-clad hills. Whether there be as much poetry in these spots as has been asserted by excited writers, it is not for me to decide, but certes, there is great real enjoyment attending these visitations, and solid comforts withal, at the well-spread tables, when the happy vigneron feels rich with his abundant harvest of rich clusters. As to the poetry, mayhap that is an ingredient which each should carry along with him, and the fortunate possessor of the commodity will then find it reflected from himself, on every hill-top, and in every vale, with their attendants of herb, tree, or vine, rocky steep, or grassy lawn, cloud, or sunshine, moon, or stars.

The meeting at the vineyard of S. RINTZ, on the 1st of October, was very spirited. All were delighted with the unusually good crop, which was extraordinarily large, and ripening very evenly, while the healthy wood gives promise of an equally fine crop next year. This is considered one of the very best vineyards in the county, and always exhibits evidence of the great care and attention devoted to it.

The next meeting was held at the residence of the President, L. REHFUSS; among other communications, the following report of the crop, and the climatic peculiarities of the season, was read by the President:

GENTLEMEN:—Since the period when I commenced making wine, no season has equaled the present (1853) in the quantity and quality of the produce. The spring set in dry and warm, the vines commenced flowering May 13th, a fortnight earlier than usual—this weather was disastrous to any cuttings of the Cape variety. In the fine weather, during the blossoming, the fructification was perfect, we had no mildew nor rot. Early in August, the grapes commenced coloring, and from the 1st to 20th of September, the much needed and copious rains brought the fruit rapidly to perfection, and so evenly that we found few green berries at the vintage, which was commenced on the 20th September, and was general on the

1st of October. Many would have preferred a later vintage, but the wasps, bees, and other insects, were committing their depredations.

The specific gravity of the must was 78 to 88 degrees by the saccharometer, rather lower than in 1852, but the must had less acidity, and will make better wine. In my own vineyard, to which I had applied special manures, and where the pinching in was done to three leaves above the fruit, two weeks before the blossoming, the berries ripened earlier, more equally, and more perfectly than usual, and the must weighed 1.092. In my other vineyard, under ordinary treatment, the lower terraces furnished must weighing 1.083, and on the upper ones it weighed 1.088. The yield was three and a quarter to four gallons per bushel—older vineyards yielded better, because their roots had run deeper, and they suffered less from the drought.

I have seen one vineyard, among the many I have visited, where the spur pruning had been practiced—the berries were of full size, and perfectly ripened, full of fruity taste. This confirmed my preference for short, rather than long bows. This is explained physiologically, by supposing that the four or six spurs will each have its more direct communication with its own roots, than the ten or twelve eyes on a long bow can have, and consequently, the grapes will suffer more in drought, nor can they be so well supplied with the perfected sap, especially where the vine dresser has broken out the laterals and shortened in the canes, thereby destroying the most healthy foliage necessary to the evaporation and transformation of the sap at the ripening season. I continue, as for four years past, to caution the members against excessive breaking out, and pinching the lateral shoots, as not adapted to the climate and other circumstances, in this country, though it may be admissible in Germany, where more abundant rains require a portion of foliage to be removed for the admittance of the sun's rays. Here, on the contrary, we need the shade.

After which, some very choice specimens were critically examined by the Society:

WINES TESTED.

DRY CATAWBA.

1. Rehfuss—1845; admired by most.
2. " " 1848; very good.
3. Feine " 1848; much admired.
4. " " 1850; very good.
5. " " 1851; admired.
6. Werk " 1851; very fine.
7. " " 1851; red and rougher.
8. Rehfuss " 1851; good.
9. H. L. Brush—1851; this sample, from a high latitude, Ottawa, Illinois, shows that the culture may be extended in that direction, and also that the wine will be less fruity, because the grapes will not ripen so perfectly as with us. Most concurred in pronouncing this a very fine delicate wine, but deficient in high flavor.
10. Rehfuss—1852; full flavored, much admired, and showing the effect of the chemical manures; this was ripe enough for bottling at six months old.
11. Rehfuss—1853; already clear, much admired
12. Rehfuss—1853; already clear, much ad mired.
13. Werk " 1853; pressed wine, colored.
14. " " 1853; pale, first run, very good
15. Rehfuss " 1853; last pressing, red, rough.
16. " " 1853; first cutting, before the rain, stronger than the next.
17. Rehfuss—1853; second week of vintage.
18. " " 1853; These samples had been
19. " " 1853; differently treated—all
20. " " 1853; are of fine promise.

FOREIGN DRY WINES.

21. Tokay—from Germany, 1834; Madeira flavor.
22. Marcobrunner—1841; extra-extra. The fine quality was attributed to the soil of a granitic region.
23. Chateaux Charbonnier, or Vin grave—this was considered a superior French wine.
24. Red Clevner—from Wittemberg.
25. Affenthaler—from the Alps, on the Lias Rocks. These were fine red wines.

CHAMPAGNES.

No. 1.	Longworth—Fournier	3 votes.
No. 2.	" "	4 "
No. 3.	Longworth—Waldmahl	0 "
No. 4.	" "	0 "
No. 5.	Werk	5 "
No. 6.	Werk	6 "

Alton Horticultural Society.

In the month of November last, some devoted friends of the cause, met for consultation, organized a society, adopted a constitution, and the following named gentlemen were unanimously elected the officers of the Society, for the ensuing year, viz:

President—Dr. E. S. Hull.
Vice Presidents—Rev. Charles Howard, and Rev. S. Y. McMasters.
Corresponding Secretary—Norton Johnson.
Recording Secretary—Jas. E. Starr.
Treasurer—John Atwood.

The stated meetings of the Society are to be held on the second Saturday of every month.

Ohio State Board of Agriculture.

The Convention of Delegates from County Societies, assembled at 10 A. M., Wednesday, December 7th, in Columbus. This is a meeting provided by law, and its special object is to fill the vacancies occurring by limitation, in the State Board of Agriculture, and also to consider and discuss the important interests of this great productive art, upon which so much of the wealth and prosperity of the State depends. The call of counties was responded to by about seventy. Many resolutions suggestive of the action of the Board, upon matters connected with the interests of agriculture were presented and discussed, this Convention being a sort of advisory body. Among these, was the following, by W. W. Mather, which he introduced with some interesting remarks:

Resolved, That this Convention recommends the Board of Agriculture to memorialize the Legislature, to establish a school of applied science and agriculture; and with a view to the establishment and permanent maintenance of such schools, in all the States, the Legislature be requested to instruct our Senators and Representatives in Congress, to urge the donation of 200,000 acres of the public domain.

A proposition was read from the citizens of Springfield, Clark county, to hold a great NATIONAL CATTLE CONVENTION, at that place, some time in September next. All agreed that the proposition was deserving of the highest praise, and a paper was signed by the most influential members, recommending the project to the favorable notice of the *United States Agricultural Society*, as a NATIONAL body, well qualified to take the lead in conducting and patronizing a NATIONAL CATTLE SHOW.

Many candidates were offered for the vacant places in the Board of Agriculture, an honorable, but a very onerous office. The following gentlemen were elected, to hold the office for two years:

J. L. Cox, of Muskingum county.
R. W. MUSGRAVE, of Crawford county.
Jos. SULLIVANT, of Franklin county.
B. STEEDMAN, of Cuyahoga county.
J. K. GREENE, of Hamilton county.

The members holding over, are:

Jas. T. Worthington;
David McIntosh;
Wm. Ladd;
R. W. Steele;
Jos. G. Gest.

Some interesting discussions then ensued; among them, that upon the important subject of *Hedges* excited a very spirited talk, and elicited much valuable information. The practical knowledge and experience of those who knew the subject under discussion, through actual acquaintance, was beautifully contrasted with the empty denunciation and cries of humbug, from those who were forced to admit the want of experience and practical knowledge.

It is generally supposed that the next State Fair will be held in Zanesville, despite the limited accommodation for such a crowd as should attend such a meeting, and notwithstanding Cincinnati stands ready to make up a grand show, is accessible, and can accommodate all who may come.

By way of giving a useful turn to the discussions, and as an interlude to the more laborious duties of *legislation* and *regulation*, the Editor of this paper was twice honored with an invitation to address the Convention. His first topic was upon the nature and use of Gypsum, as a manure or fertilizer; in this paper Plaster was highly recommended as a manure. Its chemical composition, and the *rationale* of its action upon vegetation were set forth. He claimed for it that it was not to be considered a mere stimulus, but should be looked upon both as a food of plants, furnishing elements necessary to their healthy constitution, and also more particularly acting as a fixer of ammonia, the common-carrier of other food, such as the obdurate flint, which it renders soluble so as to be carried up into the straw, and itself an important food of plants, furnishing nitrogen.

The reader showed how plaster could fix the volatile ammonia, and prevent its escape into the atmosphere; and recommended its use in stables, compost heaps, and, as a means of health and comfort, in all places whence disagreeable emanations escaped, to the annoyance of man. He illustrated his paper by showing the crude article, and in different states of preparation. The specimens were presented to the Museum of the Board.

At a later period he was again invited to take the stand, when he presented the importance of FLAX CULTURE to the farming interests of Ohio, since the introduction of the new methods of preparing the fiber without rotting. It was stated, that by this process, the tedious, disagreeable, and unhealthy plan of rotting, was entirely obviated; and that the fiber could be separated from the gum in twenty-four hours, by a simple apparatus, and that an immense quantity of valuable albuminous food, suitable for hogs and cattle, was prepared during the operation. It was asserted that the Agricultural Report shows a production of 80,000 tons of flax straw, capable of yielding twenty-four millions pounds of flax fiber, worth nearly three millions of dollars per annum, all which is now neglected and wasted—while at the same time, the United States is paying $20,000,000 for the manufactured article, produced by foreign labor.

The manufacture of flax is now established in New England, but there is a lack of fiber in the country, and the supply of lint has to be imported from Europe. The reader forcibly urged this subject upon the attention of the Farmers of Ohio, as one commended by every consideration of economy and profit, and he successfully controverted any prejudice that may have existed against flax culture in our State and country.

At the conclusion of the papers, they were requested by the Convention as a contribution to the next Report.

After the adjournment of this body, the *Board of Agriculture* held an executive session, at which the new members took their places, and proceeded to organize, by the following election:

R. W. Musgrave, President;
Jos. Sullivant, Treasurer;
Jas. L. Cox, Secretary;
Geo. W. Sprague, Corresponding Secretary.

Some business was transacted, and the Board adjourned to meet at Columbus, January 17th, proximo.

The Missouri State Fair

Was held at Boonville, October 3d,–6th. It appears to have been well attended, for a first Fair.

The following officers were elected for the coming year:

President.—M. M. MARMADUKE.

Vice Presidents.—JNO. L. H. HARDEMAN, JNO H. MCNEIL, CHAS. MCCORMACK, CHAS. H. BROADWATER, NEWTON G. ELLIOT, DABNEY C. GARTH, THOS. C. ANDERSON.

Corresponding Secretary.—JAMES L. MINOR.

Recording Secretary.—J. L. STEPHENS.

Treasurer.—WM. H. TRIGG.

North-Western Pomological Convention.

MANY of the most devoted lovers of Pomona, have been looking forward with bright anticipations, to the assembling of this body of very intelligent pomologists. The meeting was held at Chicago from the 4th to the 7th of October, and exceeded the expectations of the most sanguine, in the number and beauty of the fruits presented. They were spread in masses upon extended tables, and constituted one of the most interesting exhibitions ever made in the western country. The chief contributors are here mentioned, to show the range of country represented at the meeting, and the number of varieties grown.

Delegates were present from eight states. Among them, Chas. Downing, from Newburgh, New York. A. H. Ernst and others from Ohio.

The meeting, with its discussions, was a very pleasant occasion to all, and furnished an opportunity of making and renewing many agreeable acquaintances. The proceedings will shortly be published in detail.

Burlington, Iowa, was selected as the place of holding the next meeting, on the 26th of September, 1854, when the session is to last four days.

Messrs. Avery and Comstock, of Burlington, Iowa, had a very large and choice lot of fruit. They exhibited about 25 varieties of pears, 20 of peaches, and 150 of apples. Their fruits are much larger and finer than those sent by eastern pomologists.

M. L. Dunlap, of Dunlap's Prairie, exhibited 60 specimens of apples, 4 of pears, 20 of peaches, the hard-shell almond, nectarines and Isabella grapes.

Dr. Haskell, Rockford — 62 varieties of apples, 5 of pears; Isabella and Catawba grapes.

Arthur Bryant, of Princeton, — 52 varieties of apples, 4 of pears, and Orange Quinces.

A. Montague, Wadham's Grove—50 varieties of apples.

Dr. Kennicott, of the Grove—50 varieties of apples, Isabella and Catawba grapes.

Dr. L. S. Pennington, Sterling, Whiteside Co.—70 varieties of apples, 6 of pears.

R. Hathaway, of Little Prairie Ronde, Mich., 20 varieties of apples, a seedling pear, and seedling peaches.

Smiley Shepherd, Hennepin — presented 90 varieties of apples, 6 of peaches, and Isabella grapes, which were very fine.

Wm. Stewart and Son, Quincy—from 90 to 100 different kinds of apples.

Samuel Edwards, Lamoille, exhibited 47 varieties of apples, 3 of grapes; strawberries and apricots in spirits.

E. Ordway of Freeport, 12 varieties of apples.

A. R. Whitney, Franklin Grove, 41 varieties of apples.

D. B. Drake, of Elk Grove—4 varieties of grapes, 7 of peaches, and a number of seedlings, 8 pears, 54 apples.

E. W. Brewster, Freeport—19 varieties apples, 4 pears.

J. M. Humphrey—20 varieties of apples.

N. Hotchkiss, Belvidere—34 varieties of apples.

J. J. Thomas, Wayne County, N. Y., a large collection of fruits.

Wm. H. Loomis & Co., South Bend, Ind.—42 varieties of apples, 35 of pears.

A. H. Ernst, Cincinnati — 56 varieties of apples, 4 of pears, 2 stalks of Japan pea.

A. Fahnestock, of Syracuse, N. Y.—104 varieties of pears, 50 of apples.

Underhill & Carpenter — 26 varieties of apples.

D. F. Kinney, Rock Island—24 varieties of apples, grapes, seedling peaches and some sweet potatoes.

H. H. Holmes, of Rockford—33 varieties of apples, 4 of grapes, 5 of plums.

Hubbard & Davis, Detroit—16 varieties of apples, 7 of pears, and 6 of peaches.

E. R. Phœnix, Delevan, Wis.—60 varieties of apples.

Ezra Stetson of Galesburg, Mich., 86 varieties of apples, pears, and quince.

J. C. Holmes, of Detroit, 28 of pears, and a quantity of Clinton grapes.

Cyrus Bryant, of Benton County, 29 varieties of apples, and 3 pears.

H. S. Finley, 20 varieties of apples, 2 of pears, and a box of grapes.

John Belangee, Dover, 42 of apples, some pears.

E. Harkness, Peoria Co., Ill., 68 varieties of apples, grapes, pear, and quince.

Edward S. S. Richardson, 24 apples, 3 pears.

John T. Seely, of Kendall, 14 apples.

Sterling Perkins, of Cold Water Mich., 60 varieties of apples, 4 pears, grapes, and quince. Also six bottles of new cider.

C. R. & M. Overman, Canton, 60 varieties of apples, 8 of pears, quince, peach, and osage orange, or Maclura.

The discussions were very interesting, and resulted in some definite results. They were continued from time to time, and a brief epitome is now offered. The reader is referred to the pamphlet, which will be furnished to those forwarding the member's fee of one dollar to Dr. Kennicott, West Northfield, or to S. Edwards, Secretary, Lamoille, Ill.

THE GRAPE.—The Isabella, recommended as one of the best, if not the best, for extensive cultivation in the north-west. The Catawba was voted superior in all localities where it would ripen. The Clinton not sufficiently known for recommendation.

PEARS. — The Bloodgood and Dearborn's Seedling, recommended for further trial. Madeleine, too subject to blight. Bartlett, best for general cultivation. Flemish Beauty, one of the best. Louise Bonne de Jersey, very good. Seckel, the best. Washington, not sufficiently tested. Beurré Diel, not sufficiently tested. White Doyenné, and Easter Beurré, best for general cultivation. Prince's St. Germain, too little known. Winter Nelis, good winter pear —not successful in all localities. Passe Colmar, very good. Des Nones and Hosenschenck were introduced and recommended by A. Fahnestock of Syracuse, N. Y.

A paper was read, containing remarks on the cultivation of the Pear, by Professor Kirtland, of Ohio, embodying much valuable infor-

mation touching the nature of the blight, the benefit resulting from the application of special manures, the elements most essential to their successful production, etc. Other papers were referred.

PEACHES.—Crawford's Early and Early Bernard, were recommended for general cultivation. The Early York, best Early Peach, large White Cling, recommended. Tippecanoe, not well known. Old Mixon, free, good, but surpassed by Early Strawberry. Crawford's Late, recommended. George the Fourth, best of its season. Lagrange, thought good.

APPLES.—Summer Rose, recommended. Early Joe, recommended for further trial. Holland Pippin, with its synonyms, not worthy of general cultivation. Lyman's Pumpkin Sweet, recommended for culinary purposes and stock feeding. Mother apple, well worthy of further trial in the West. Hubbardston Nonsuch, ditto. Herefordshire Pearmain, esteemed worthy of extensive cultivation. Blue Pearmain, recommended for limited cultivation. Pomme Grise, ditto. Peck's Pleasant, recommended for further trial. Roman Stem, worthy of cultivation. Golden Russet, of western New York, recommended for limited cultivation. English Russet, ditto. Milam; after a general and somewhat long discussion, a motion was put to consider this variety as unworthy of cultivation. Further remarks were elicited, which went to show that the popularity of a fruit may bear no comparison to its true worth. Spice Sweeting, recommended for further trial. The Rhode Island Greening, was the subject of some remarks, which seemed to show that it does extremely well in the North, while it does not succeed at the South equally well. The discussions were very spirited.

Wisconsin Fruit Growers' Association.

This Society was called at Watertown, at the close of the last State Fair, and was organized at Whitewater, Nov. 18th, by the election of

H. J. STARIN, of Walworth, *Pres.*
L. C. HALSTED, }
MILES HOLMES, } *Vice Presidents.*
S. P. LATHROP, }
MARK MILLER, of Rock, *Sec'ry.*
E. B. GRINNELL, of Jefferson, *Cor. Sec'ry.*
R. W. PARKER, of Milwaukie, *Treas.*

The duties [and privileges] of members, consist in bringing to the annual meetings, specimens of fine fruits, and scions of new varieties, considered worthy of dissemination.

It is hoped, that they will advise us and the world of the time of their annual meetings, in due season—meanwhile a good time to them.

Mobile Horticultural Society

Holds meetings during the season, as appears from the reports in the *Alabama Planter*. At these there have been discussions, and exhibitions of interest. On a recent occasion, the President, C. C. LANGDON, introduced the subject of Manures, especially guano, and superphosphate of lime, the *improved;* it is supposed the testimony was rendered in favor of the latter, though both were considered valuable. The soil of the President's experiments was level table-land, with a compact clay subsoil.

Mr. MCGUIRE, (*Corresponding Secretary*) was familiar with all the soils of Alabama, and thought that with deep tillage, and the use of fertilizers, the lands about Mobile, (poor and unfertile as they might be deemed) would produce more satisfactory results, with the marl of their own State, and other fertilizers, than the best river and prairie soils.

It was proposed to hold a second grand Horticultural Fair, about the middle of April, or first of May. May it be even more productive than the previous occasion, is our wish.

New York State Agricultural Winter Meeting.

From the 7th to the 9th of February next, this Fair will be held in Albany. A liberal premium list is offered, for crops, fruits, roots, poultry, dead meats, and essays. A cup worth one hundred dollars, is offered for the most satisfactory experiment in the preparation of flax. Two hundred and fifty dollars, in three premiums, for the best experiments in the culture of potatos.

Addresses will be delivered in the evenings, by the President, LEWIS G. MORRIS, and by Prof. E. CARR. When will our *State Board of Agriculture* emulate this feature of the New York Society? Our neighbors of Indiana are already on the track, and Maine is to have her Convention of Agriculturists, or *Farmers*, this winter, a regular "class-meeting of agriculture."

Montgomery County Agricultural Society.

This energetic organization is already in the field, with a liberal premium list for 1854. The Fair is to be held at Dayton, Oct. 3d, and 4th. Verily, the State Fair has stirred up the right spirit. The offer of several volumes of this standard work of Horticulture, among the premiums, evinces a just appreciation of its appropriateness for such a purpose, indicative of the good taste of the managers, worthy of imitation.

Officers for the year:—

JAMES MCGREW, *President.*
DAVID THATCHER, *Vice President.*
R. W. STEELE, *Treasurer.*
O. KITTREDGE, *Secretary.*

Wisconsin State Agricultural Society.

OFFICERS.

President.—ELISHA W. EDGERTON.
Vice Presidents. — BERTINE PINKNEY; NATHANIEL B. CLAPP; JEREMIAH E. DODGE.
Corresponding Secretary.—ALBERT C. INGHAM.
Recording Secretary.—ALBERT C. INGHAM.
Treasurer.—SIMEON MILLS.
State Agricultural Rooms, Capitol, Madison, Wis.

ST LAWRENCE APPLE.

The Grape—The Vineyard.

NO. II.—PREPARATION OF THE SOIL.

HAVING determined upon the soil and position that promises to be best adapted to the vineyard, the next step will be the preparation of the land. Should the subsoil be tenacious, clayey, and holding water, even in a small degree, it will be advisable to lay drains, but if it should happen that the ground be at all spouty, it will be absolutely necessary to under-drain thoroughly, otherwise it will be a loss of labor to prepare the soil in the usual way, and a loss of plants to set them out upon it; for the grape is as fastidious of a wet foot, and as easily affected as the most delicate invalid.

Of the importance of draining, as a means of meliorating the soil, most persons are not sufficiently aware—none but those who have witnessed the good effects of this process can properly appreciate its great benefits; for it has been well and truly said, that by draining, the soil is kept from being too wet, and also preserved from the effects of drought—that it is warmed by the summer showers, and escapes the chilling influence of excessive moisture, and is kept from being baked by excessive heat—that it is percolated by currents of the all-pervading air, laden with treasures of food for the plants, while at the same time the cutting blasts of winds pass harmlessly over it without drying out all of the moisture and producing excessive cold by its evaporation. The advocate of draining is thus apparently obliged to blow hot and cold; but these assertions, contradictory as they appear, are all supported by abundant testimony deduced from repeated experiments.

This matter is of so much importance that the reader will excuse the introduction of the following ten reasons urged in favor of this operation—they are sound and philosophical, though a thoughtless person might at first suppose them somewhat contradictory. These reasons are somewhat modified from the copy in the *Cultivator:*

Draining prevents rain-water from resting on or near the surface, and renders the soil dry enough to be worked or plowed at all times.

By rendering the soil porous, it can take in water without flooding in time of rain, and give it off gradually in time of drought.

By preventing adhesion and assisting pulverization, the roots can pass freely through all parts of the soil.

By facilitating the mixture of manures through the pulverized portion, their value and effect are greatly increased.

Water falling on the surface passes downward, carrying with it any fertilizing substance, (such as carbonic acid or ammonia), until arrested by the soil.

In a similar manner it abstracts the heat contained in falling rains—the soil is thus warmed—for the water discharged by drain-mouths is found to be many degrees colder than ordinary rains.

The increased porosity of the soil renders it a more perfect non-conductor of heat, and the roots of plants are less injured by freezing in winter.

The same cause admits the entrance of air and facilitates decomposition.

By permitting early plowing, or digging, the crop may be sown earlier, and an increased yield will be the consequence.

Draining economizes labor by allowing the tillage to progress at all times, without interruption from surplus water in spring, or from a hard-baked soil in summer.

The directions, then, are repeated to all who would plant a vineyard—drain the soil thoroughly, even if the situation be a steep hillside; for it is believed that many of the vines so situated have suffered from the retentive subsoil of our hills, even where the declivity would appear to be such as to provide the most perfect surface drainage. For the minutiæ of this operation, the reader is referred to essays upon this subject already before the public, especially to those of Messrs. JOHNSON and PARDEE, which were published in the New York Agricultural Transactions, and which have been reprinted in several periodicals.

The principles to be borne in mind are, that as water will find its level, parallel drains, deeply placed, will effect the drainage of the soil on either side to a greater or

less distance, according to the tenacity of the soil—practically, the deeper the better, but always below the reach of the deepest culture—the drains, whether of drain-tile, stone, wood, or even brush, should be commenced at or near the summit of the hill, for such places require drainage much more frequently than is generally imagined, and the lower drains can never be so efficient as when the higher ground is first relieved of its surplus moisture.

This primary object having been effected, the next step is to prepare the soil for the noble crop which it is expected to sustain. This being a work destined to last for a lifetime, it is all-important that it be well performed. If the vineyard be expected to yield profitable returns, there should be no niggardly expenditure in the arrangement but the most thorough preparation of the soil is to be effected. The best method of doing this is to trench the land with the spade, digging it two or three feet deep, or as much more as you choose; it has been asserted by some that if the soil were stirred to the depth of ten feet, the crop would be all the better for the operation, and the vines would continue to yield profitably for a longer period.

The article upon the Mode of preparing the Garden by trenching the Soil, which may be found in the last number of the *Review*, is recommended to the attention of those who expect to prepare a vineyard, if their land be level or gently sloping; but so many persons prefer a slope, often a precipitous declivity, that a somewhat different course will be necessary. In such situations, it becomes advisable to throw the surface into terraces or benches, as they are called, so as to reduce the land to a series of levels, or gentle slopes; this process is called *benching*, and although the object, deep culture, is effected, it is somewhat differently performed from the common business of trenching, and will need a description.

When a piece of land is to be benched for grapes, the first thing to be done is to lay off the work. Commencing as low down the hill as the vineyard is to extend, a row of stakes is set nearly at the same level, but slanting down hill a little at either end, or, if long, at both ends. From these, and as nearly parallel to them as the character of the declivity will permit, and as far up the hill as its slope may require, another row of stakes is to be placed, declining at either end sufficiently to carry off the surface water gently. The distance between these two rows will be the width of the future bench, and must be determined by the steepness of the ground and by your determination to have the general surface of the terrace incline toward the hill or from it; in the former case the distance must be less, in the latter it may be greater, and then the effect will be simply to reduce the slope by raising the lower portion and lowering the upper part. Many prefer narrower benches, so constructed that all excess of water shall be carried toward the hill, to be there received by a gutter, or still better, by a covered drain, which shall carry it to the ends of the bench, or to an open main channel running down the hill. Benches vary from a few feet to several rods in width.

Having determined these points, and set the stakes accordingly, the formation of the terraces next depends upon the material to be used for their construction, for these hanging gardens must be well supported, as they are to stand for a lifetime at least, and it is always difficult to repair breaches, and is much better to provide against accidents in the first place. If stone abound in the soil, it is used for the walls at the lower side of each terrace, and this material gives a substantial character to the work; walls are expensive, however, and, beside, they furnish a harbor for vermin, as the stone should be laid up dry, or without mortar or cement—the hight will depend upon the conditions already mentioned, the steepness of the hill, the width of the terrace, and the direction of its slope or surface. It would, probably, not be advisable to purchase, nor to transport stone for this purpose, but if it be at hand, the appearance and the permanence of the work would indicate the propriety of its use.

Commencing, then, at the lowest row of stakes, the ground is excavated to a sufficient depth and width to give the wall a good foundation, in which it is then constructed

and carried up to the necessary hight; the earth of the land marked off for the terrace is thoroughly trenched, all the surface soil being thrown to the bottom and the subsoil being brought to the top, care being taken to regulate the grade during this operation —a very easy matter to a practiced eye, accustomed to dealing with surfaces. Great care should be exercised in digging, to have the upper portion of the bench deeply stirred, for it is most natural to have deeper soil at the lower part, against the wall; this will require the overseer to watch the laborers closely, especially if the work be done by contract. The upper part of the terrace is finished by an excavation for the foundation of the next wall, the bottom of which may be arranged for the drainage.

If, from absence of stone, or other reason, it be determined not to use walls, a very good substitute, producing, to some eyes, a still prettier effect, is always at hand in the grassy fields usually selected for the vineyard. In the tenacious soils of this neighborhood, the tough sod or turf of green grass (Kentucky blue-grass) forms an excellent material for supporting the terrace, when not too high. The diggers select this in the beginning, and construct their embankment as they proceed, arranging the best sods in a steep slope at the lower side, and throw the rest of the earth above it in making the terrace; in this plan it is almost impossible to avoid having too much of the rich surface soil accumulated on this part of the bench. In finishing at the upper row of stakes, the same care before advised should be exercised, to have a sufficient depth to the trenching; and again a foundation is opened for the wall, or bank. The next rows or spaces staked off are then prepared in the same manner until the summit is reached, when trenching alone, without walls, is all that will be required.

These grassy walls or terrace banks are made as steep as they can be sodded without slipping—they generally form an angle of about forty-five degrees, with a vertical line. They answer very well for low embankments, and when the natural sod of our pastures is employed for this purpose, the effect of these bright green stripes passing horizontally around a hill, when seen from a neighboring eminence, is peculiarly striking. One circumstance must be particularly borne in mind, and will require attention in due season. This blue-grass (*Poa pratensis*) requires peculiar treatment; it is here most favorably situated for making a strong growth, which needs to be mowed with the scythe, and this must be done in due season. This grass shoots forth its spear or spire of inflorescence early in June, hence, often called spear or June grass, and requires to be cut at the time of blossoming, or the turf below will not recover its green appearance for a long time. It should never be allowed to ripen its seed, as its growth, scattered over the terraces, would be very troublesome. The mowing of these grassy walls is done with a common scythe, hung for this purpose in such a way as to apply itself to the surface; the workman stands at the upper side and stoops down to the work. In a small vineyard, the grass is often cut with a Dutch grass-knife, a kind of sickle of German manufacture. When cut it may be removed for feeding, or, better still, left on the ground and applied as a mulching material.

Where the ground selected for a vineyard is not precipitous, but gently sloping, or nearly level, no benches will be required; or, perhaps, one wall or sod bank may be placed at the bottom of the declivity; the latter, in trenching, may be formed from the earth thrown out of the first excavation—it will give a finish to the work and save the wash from above; if built of stone and carried up sufficiently high, the wall may serve as a fence to separate the vineyard from adjoining pasture lands. On a gentle slope not requiring benches, another plan has been suggested and carried out very handsomely by R. Buchanan; the cartways between the squares or subdivisions are carefully sodded in a shallow gutter form so as to convey off the surplus rain-water. This author, in his excellent little Treatise, which should be in the hands of every one engaged in wine-culture, alludes to this subject, under the head of draining, in the following words: "Surface draining may be obtained by *concave sodded* avenues of ten feet wide, and

intersecting each other at one hundred, or one hundred and twenty feet, thus throwing the vineyard into squares of that size; this will do for gentle declivities."

Plowing.—Some persons, especially those who have selected a level position, or the summit of a ridge which is nearly level, will feel unwilling or unable to incur the great expense of trenching a large extent of vineyard, at a cost of fifty dollars per acre. Though not generally recommended, plowing may be substituted for spade husbandry, if care be taken to have it very thoroughly done, and, with the aid of modern improved implements, this may be executed with considerable effectiveness. The largest sized plow, drawn by a powerful team, is used to reverse the surface soil to a depth of one foot; the Michigan double plow may be found better suited to this work than any other, because it may be made to turn a narrower furrow-slice, and at the same time open a deep trench, and thus the work can be adapted to the strength of the team. The next process will be to loosen the deeper earth thoroughly with a subsoil plow drawn by a powerful team, and kept down to its full depth, so as to stir up the soil for a foot or more, leaving it broken but not excavated. If it be desired, a plow with a peculiar mold-board, or the Michigan plow itself, is then introduced, and the loosened earth is thrown out upon the furrow left by the breaking-plow first used. The subsoil plow is then again passed along the furrow. This will require two or three teams and as many plowmen, but will effect the object, of stirring the soil pretty effectually, for the depth of twenty to thirty inches.

Some very fair vineyards may be found that have never been trenched and only prepared with the plow; but the practice is not sustained by the best vignerons, and apprehensions are entertained that such superficial preparation will not be followed by enduring vines; many of the vineyards of Europe, however, have had no better preparation.

Another method prevails among a portion of the German vine-dressers—it is called the bed or ridge system, and is adapted only to level land, or to gentle slopes. It consists of the construction of ridges about a rod in width, well trenched, and having wide gutters left open between them; the chief advantages appear to be thorough surface drainage and deeper tilth. J. A. W.

New Fruits.

In the ad interim Fruit Report, of December 20, 1853, to the Pennsylvania Horticultural Society, the following notices are found:

General Taylor—*From Lloyd N. Rogers, of Baltimore.*—Size, under medium, two and a half inches long, by two and a half wide; form, turbinate, obscurely pyriform, broad at the crown; color, cinnamon russet, becoming fawn on the exposed side; stem, three-fourths of an inch long, and one-eighth thick, inserted into a very small cavity; calyx, partially closed, set in a broad, not very deep, furrowed basin; core, medium; seed, dark brown, ovate, no angle at the obtuse end; flesh, yellowish-white, granular, becoming buttery and melting, but somewhat gritty at the core; flavor, as high as the Seckel, aroma delicious; quality, "best;" maturity, November. The General Taylor is believed to be a native of Maryland. The tree, supposed to be the original one, grows near Baltimore, and is about twenty-five or thirty years old. It presents no evidence of having been worked; and Mr. Rogers assures us, that scions, taken from suckers which sprung up from its root, have borne fruit similar in all respects to that of the parent tree. We commend the variety to the attention of Pomologists.

The Niles Pear—*A very large specimen, from Wm. V. Pettit, Esq.*,—Size, four inches long, by three and three-fourths broad, and weighing one and one-fourth pounds; form, roundish, oblong; color, yellow at maturity, with many russet dots; stem, one and one-fourth inches long, and one-fifth thick, inserted in a narrow, rather deep, furrowed cavity; calyx, small, closed, set in a deep, narrow, regular basin; seed, light brown, large, plump, long, acuminate; flesh, somewhat granular, becoming buttery; flavor, not high, but saccharine, and pleasant; quality,

"very good;" maturity, December; an abundant bearer of fair and large fruit. This is a foreign variety, imported from France, by the Hon. JNO. M. NILES, of Hartford, Conn. The imported tree was sent by him, some years ago, to his friend, WM. V. PETTIT, ESQ., of this city. Our attention was first directed to it, by MRS. CATHARINE STANLEY, of East Hartford—an Honorary and Corresponding member of our Society, and distinguished as well for her moral, social, and intellectual accomplishments, as for her zealous and untiring devotion to Horticulture. Being unable to recognize the variety, and its true name having been lost, we designated it the Niles. Some of the Boston Pomologists, who are more familiar with the Easter Beurre than we are, consider it that variety; while others unhesitatingly say it is not the Easter Beurre. Without giving a decided opinion on this point, we will merely remark that it differs from the specimens we have been in the habit of seeing of the latter, in being more oblong in form, of a more yellow color, having a longer stem, a deeper and more regular basin, and in its earlier period of maturity.

BEURRE CLAIRGEAU.—This large and valuable new foreign Pear, received from Hon. B. V. FRENCH, was noticed, and an exterior description of it given in our October ad interim Report. The specimen, not being sufficiently mature at that time for testing, was laid aside, and was not cut till the 9th of December, when it was somewhat shriveled. We now complete the description, commenced in October—Core, under medium; seed, dark brown, small for the size of the fruit, elongated, narrow, plump, with a prominent angle at the obtuse end; flesh, yellowish-white, buttery, melting; flavor, perfumed, and delicious; quality, "best." The Beurre Clairgeau has been described, and figured both in the Horticulturist and Hovey's Magazine; and its period of maturity is represented to be October and November. The advanced season of the year, December 9th, when our specimen was eaten, may have enabled it to develop more completely, its fine qualities. To this, or to some other auspicious circumstance, may, perhaps, be attributed the somewhat higher estimate expressed by us of its quality, than that entertained by some other pomologists quite as competent as ourselves to judge of its merits. At any rate, we are fully persuaded, that the specimen examined by us was, in all respects, justly entitled to the highest grade of excellence.

CUSHING RASPBERRY—*From Mrs. John R. Latimer.*—Grown by HARTMAN KUHN, Jr., Esq., of this city. Specimens remarkably fine. The autumnal fruit of this twice-bearing variety, is even larger than that which ripens in summer, at the usual raspberry season.

BLACKBERRIES.—Having learned from various sources, that the Blackberry grown in the valley of the Wyoming was of unusual size, we were anxious to see specimens of the fruit. This, the kind attention of Judge WOODWARD enabled us to do, about sixteen months ago. The specimens then forwarded to us, though in a dried state, were remarkably large; and we hoped, by planting the seed, to obtain varieties still finer; but unfortunately, none of the seed vegetated. The specimens now received were gathered during the summer of the present year, and put into a bottle of alcohol, which escaped. The berries therefore, did not retain their full size, and yet some of them measured one and one-eighth inches in length. The number of pips contained in each, is unusually great; in one berry we counted 113, in another 146. In form, the fruit resembles that of the cultivated high bush variety of Boston.

The Blackberry is, no doubt, capable of considerable improvement in size and quality. With a view of ascertaining to what extent this can be accomplished, by cultivation, by crossing, and by raising seedlings, we are desirous of obtaining some of the most remarkable kinds, from different sections of our country. The blackberry, like the raspberry, may be propagated with great ease, and with almost magic rapidity, by division of the root into small sections.

BELT'S HYBRID WALNUT.—The history and appearance of this unique and interesting hybrid, present unequivocal evidence that it is a natural cross between the Butternut (Juglans Cinerea,) and the English

Walnut, (Juglans Regia,) the latter being the maternal parent. It originated about twenty years ago, at Chevy Chase, the residence of Col. BELT, near Washington, District of Columbia, from an English Walnut, planted by his brother, Capt. WM. I. BELT, late of the United States Navy. Capt. BELT procured the nut from an English Walnut tree, in the garden of Mrs. BOWIE, of Prince George's county, Maryland. Within a few hundred yards of Mrs. BOWIE's residence, grew a number of Butternut trees, some of the pollen from the blossoms of which, had no doubt, been wafted by the wind, or conveyed by insects to the English Walnut tree in the garden, and occasioned hybridism. After the nut had sprouted, Col. BELT took it up, and replanted it, in the locality it at present occupies. The tree is a vigorous grower, and is represented as being exceedingly ornamental. In 1852, it fruited for the first time; and in September of the same year, specimens of the nuts, with the wood and foliage, were exhibited by Mr. JOSHUA PIERCE, of Washington, at the meeting of the American Pomological Society, in Philadelphia. The nut, in its general appearance, differs very materially from any others of the Juglans family:—size, large, one and three-fourths inches long, one and seven-twelfths wide, and one thick, exclusive of the remarkable carena, elevated a fourth of an inch above the surface, and extending entirely around its longitudinal circumference; form, ovate, pointed at its apex; exterior surface, deeply and boldly, but interruptedly, and irregularly sulcated, without having the continuous longitudinal furrows, usually noticed in the Butternut; color, light brownish yellow; kernel, fine. Mr. PIERCE has succeeded in two instances, in grafting this variety on the English Walnut. What has been the success of others, in propagating it, to whom scions were sent, we are not informed. It is extremely difficult, to graft the Walnut in any of the ordinary ways. Owing to the excitability of its buds, they are apt to push, and exhaust the organizable matter of the scion, before its union with the stock can take place. This usual cause of failure, is obviated by working, as recommended by the late President KNIGHT, with the base of the annual shoots, the buds of which are small, and but little developed. Another successful mode, noticed in D'ALBRET's recent work on grafting, is to cleft-graft in the side of the young shoots, and is said to answer well, whether performed in the solid or herbaceous state. In regard to the stock for BELT's Hybrid, we would suggest the Butternut for standards, and the Juglans Præparturiens for dwarfs.

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In noticing this interesting nut, in our last report, we stated, from information we had received, that Mr. JOSHUA PIERCE, a skillful nurseryman of Washington, had "succeeded in two instances, in grafting this variety on the English Walnut." Mr. PIERCE has since informed us, that this statement is partially incorrect. It is true, he succeeded in two instances, in grafting the Hybrid, not, however, on the English Walnut, but on the Butternut. Scions were inserted, in various ways, by him, on about a dozen stocks of the English Walnut, without union taking place in a single instance. These stocks having been transplanted only a month previously, may, as he intimates, in some measure, account for the failure of the operation. In the two cases in which he was successful in working the Hybrid on the Butternut, his mode of grafting differed from any of those in ordinary use, and requires special notice. In our preceding report, we alluded to the great want of success experienced by Horticulturists in grafting the Walnut, and recommended two ways of obviating the difficulty. Mr. PIERCE deserves our cordial thanks for communicating to us a third one, which in his hands has been attended by promising results. And that we might clearly comprehend it, he very kindly sent to a member of the Committee, one of the two trees he had successfully worked. His mode, which is a species of inarching or grafting by approach, is performed in the following manner:—A portion of the scion, at a point about two-thirds of the distance from its lower end, is pared away, well down into the alburnum, two inches in length; a corresponding portion of the stock, near its crown, is also removed. The scion and the

stock, after being both tongued, are to be accurately adjusted, so that the inner bark of the two shall be in exact apposition. He then binds them firmly together, with a strip of bass matting, and applies a covering of grafting clay; after which the earth is heaped up around it. Before proceeding to the operation, it is of course necessary, to remove the earth from about the root of the stock, sufficiently far to enable the heel of the scion to penetrate some distance below the surface. Mr. PIERCE thinks he removed the top of the stock, at the time the graft was inserted, but suggests the propriety of allowing it to remain until complete union between the scion and the stock is fully established, and then cutting it off close down o the point of connection. The theoretical dvantages of the mode of grafting now described, in cases of unusual difficulty, are obvious; and its practical utility is strikingly exemplified in the worked specimen very kindly forwarded to us by Mr. PIERCE. Although not entirely novel, the plan had probably never before been resorted to in the case of the Walnut. A proceeding somewhat analogous, has been employed in propagating the Camellia, in which case, however, the heel of the scion is immersed in a vessel of water, instead of being inserted in the earth.

Southern Grapes.

WE publish, with much pleasure, the following letter from a gentleman of South Carolina, to the author of a late valuable treatise on the Grape Culture. The facts stated in reference to some apparently new varieties of native grape, well merit the attention of cultivators. We shall have something more to say on some special points of the letter, in another department.—*Eds. Rev. and B. Mag.*

MR. R. BUCHANAN:

DEAR SIR—I am induced, from a perusal of your valuable work, on the Culture of the Grape, and Wine-making on the Ohio, to communicate to you the results of our trials, and experiments, in the same business, in these, our high southern pine lands. Although separated by immense tracts of forests, high mountains, and broad rivers, almost as formidable as the Atlantic itself, yet we are working in the same cause, for the same country, and we, no doubt, feel the same interest in each other's success, as tho' we were next door neighbors. We should give each other the benefit of our experience; communicate our failures, our successes, exchange our views on the subject, and we will all derive benefit from it. We have to create, in America, a Grape Culture and a Wine-making of our own. We can take a few hints from the old countries, but we must modify them to suit our own. And even in this, our broad country, we cannot follow exactly in each other's footsteps. Our climate here near Aiken, is totally different from yours. Our soil is still more widely different. We are on the burr-stone formation, entirely silicified, and completely destitute of lime. The growth of our forests consists, mostly, of pitch-pine, with yellow-pine, intermixed with oak and hickory. It would be interesting to compare the production of our vineyards, with reference to these differences.

There are yet but two engaged in this line in our neighborhood, although others are preparing to follow our example. We have had immense difficulties to contend with, and have had to commence on a small scale, with none to encourage us. The last season was our third crop of wine. From two acres of bearing vines, I made 500 gallons. The next year I hope to have about five acres of vines. My wine of 1851, and 1852, is in color, and in taste, between the Madeira and the Hock, a little stronger than the latter, though not quite as much so as the former. It is *perfectly* pure, without the slightest addition of sugar or brandy, or of anything else. I have kept some in a hot garret-room during the whole of last summer, and it comes out perfectly sound. Like Madeira, it can be poured into a decanter, and used at will, for any length of time, without becoming acid. I will add, that it is much liked by all who have tasted it, either with, or without the knowledge of its being American wine. My process for making it, is very similar to the one you recommend.

Allowing the juice to ferment about twenty hours, with the skins, or "marc," as the

French call it, I draw the clear juice for one quality of wine, and press the "marc," for a second quality. In the fall, I fine the wine, then leave it until it is wanted for use, when I clarify it with the white of eggs, and draw it a fortnight after.

I made, this last season, an experiment, a small one, in Sparkling Champagne: my success has been complete. The wine is darker than the French, and sweeter, although I have not added a grain of sugar, or sweetening, of any kind. It is highly charged with the carbonic acid gas, so much so, indeed, that I have already lost over one-third of my bottles. This wine is, also, the *pure* juice of the grape; it is not, however, a profitable wine, on account of the breakage.

You cultivate, almost exclusively, the Catawba; I am still uncertain, whether I know that grape or not. The descriptions of it in different works, vary entirely; its fruit and leaves must also vary, in the different northern nurseries, if we are to judge from specimens sent to us. My friend and neighbor, Dr. McDONALD, has written to you, on my account and his, for plants, from the city of Cincinnati, where we hope to obtain the genuine Catawba. In your enumeration of grapes worth cultivating, you say not a word of those we mostly prize here.

1st. The WARREN GRAPE, a native of Georgia; color, dark, though not blue-black; berry medium size, bunches often very large. It is a great bearer; delightful for the table; very juicy, and, in my opinion, one of the best for wine.

2d. A small blue grape, which, from description, I take to be the BLACK JULY; it is almost too sweet for table use; when used alone, it gives a most luscious Port-wine, without, however, the astringent flavor of the Port. It *never* rots, but is not a great bearer. From its resemblance to a small, wild grape, we have here, I would suppose it to be an improved variety of it. We cultivate another grape, erroneously, here, called BURGUNDY. It is evidently a native, though I have never seen a description of it. It is not very unlike the Warren, in appearance, with a slight floury dust on the surface; transparent, just before maturity; skin, uncommonly thin; bunches large, shouldered, sometimes closely packed. As a table fruit, it is universally pronounced the very best, indeed, I might almost say, I have never met with its equal, either in this country, or in France. It is as sweet as the "Black July," above-mentioned, is more juicy, a greater bearer, and is very little subject to mildew. We prize it highly. The Isabella does very well with us; it ripens thoroughly, and bears well.

The Bland's Madeira, we here think very little of. It is too astringent. It is subject to shed its leaves, before the fruit matures—but it never mildews.

We also cultivate the famous N. Carolina grape, the SCUPPERNONG; of which, however, I have a very poor opinion. It is much liked by some, as a table fruit. There is no disputing about tastes. I have drank wine made from it, by Dr. K., it is more like brandy and sugar, than wine. I was, however, shown a letter from a gentleman in the Patent Office, at Washington, stating, that *by far*, the best wine manufactured in the United States, was made from the Scuppernong, by a Mr. JOSIAH COLLINS, near Albemarle Sound, N. C. Can this be true? If so, that grape would become most important, for it is an immense bearer, and a sure grower. It is a white variety of our Bullace, of which there are several, equal to it in size and flavor. I do not know whether this grape grows spontaneously with you, as it does with us; it is a distinct species, in fruit, leaves, and wood. I have never been able to grow it from cuttings. There is a fine field for improving from the seed.

There is much confusion in the different names and descriptions of our grapes; it is impossible to recognize them from the descriptions given by different authors; who, often, do not agree as to the name, or color, Your Society should have the best varieties, properly classed, and named according to their species, varieties, localities, etc. I propose, next summer, to make colored drawings of the bunches and leaves of all within my reach, both wild and cultivated; and should some competent person in Cincinnati do the same with your varieties, we might come to an understanding, and possibly establish *permanent* and authenticated names for

all. Mr. DOWNING's work has done much for other fruits; but the field is still open for the most important, the Grape.

With high consideration, I remain, yours,
A. DE CARADEUC.

Aiken, S. C., Dec. 17, 1853.

Vegetables — Standards of Excellence.

DR. WARDER — DEAR SIR:

WE may now fairly say, without hesitation, that Horticulture is advancing toward the same degree of perfection which has been reached by many other branches of our industrial occupations, and in her train she is drawing along her twin-sister, Agriculture. Good culture is now being universally seen and appreciated. The various markets are well supplied with vegetable luxuries, that were once unknown or rarely seen, and the more common esculents are brought into market in prodigious quantities. Throughout the country Horticultural and Agricultural societies are springing up, as thickly as mushrooms in September. Rarely do we open the pages of a fresh periodical, but we are informed of tables well filled with the finest vegetables, fruits and flowers, at this or that exhibition. Success attend them all, and may they proceed in the good work, until the ultimatum of perfection shall become the only recognized quality, not alone in the wealthy private establishment, but also in every public market. For a large portion of the year, our great cities are supplied with as fine vegetables and fruit, as any part of the world; and our exhibition tables are beginning, in many things, to present perfection itself. Now amidst this general progress, it may be well to direct a little attention to the standard of quality, by which these things should be tested. It appears to me, that this subject has not hitherto received that attention, in the periodicals, to which it is entitled; even the committees of societies seem to neglect it, and leave the decision without any standard to the judges. It may be asked, Who are so likely to know as those who are chosen by the managers? All men are not possessed of the same powers of observation, neither can all judge of perfection with the same precision; beside, we must recollect that many of those appointed as judges, are from different countries, and have each been imbued with different notions of excellence, according as the standards recognized in each man's former home. It is high time that we began to appreciate and establish an American standard, and act up to it. All societies ought to have such a guide, which should be strictly adhered to, and to which the members and exhibitors should have free access, that each may know what he is doing, and how to bring his productions toward excellence.

With regard to vegetables, it may be said by some, that any man who knows how to grow a good cabbage, knows also what a good cabbage is. A proper consideration of the matter, will show the fallacy of such an idea, for closely applied observation and continued examination will show, that as much skill is required in deciding the merits of first-rate esculents, as there is in those of the choicest florists' flowers, and the same danger of going astray, without some definite rules. Perhaps the following remarks may have some small influence in drawing attention to the subject.

All plants that are grown simply as food, either for man or beast, should contain the greatest amount of nutritive matter, with good flavor; size alone does not often produce this most desirable result, neither does it in all cases yield the greatest profit, even to the farmer, nor furnish the table with the most nourishing or palatable substances. It is true, that bulk or weight sometimes fetches most in the market, although more commonly quality pays best even there; but at present, I wish to direct attention to criteria of excellence, by which those productions that find their way to the various exhibition tables should be judged, and also be a guide to the housewife in making her purchases. Here quality ought to be the main consideration; flavor and texture will rank first, and generally, succulency combined with solidity, without stringiness, would be my guide. There are a few exceptions, in which an over-succulent vegetable would be objectionable, as the potato, for instance, where the best qualities are found in the dry mealiness. An over-watery esculent should be discarded, unless in the case of those

grown as Salads, or which are eaten in a raw state, and here the water may so abound as to destroy flavor, though this is certainly not often the case. *Form* is generally the next point for consideration; while in a few, color ought to be equally regarded, as in Beets and Peas. Size is only a property of minor consideration. In making this last observation, I would not discourage those methods of growing vegetables which are calculated to make them attain large size ultimately, (for good culture will do this, and will also produce the best flavor), but would speak of them as they ought to appear at the exhibition, or in the most suitable state for the table.

Those vegetables, whose roots, as they are generally termed, are used as food, may be divided into the tuberous, as in the Potato; spindle-shaped, as in the Carrot; napiform, as in the Turnep; and bulbous, as in the Onion.

The *tuberous rooted* include the common Potato, Jerusalem Artichoke, Sweet Potato, etc., and ought to be even on the surface, free from indentations—if globular or oval shaped, so much the better. This class should likewise be solid, and should contain much starch, which is the nutritive matter; when cooked the sample should be dry and mealy. In the case of potatos, it were desirable that a boiled portion should accompany the specimen exhibited, which would determine, not only the quality, but likewise show whether it retained its color.

The *spindle-shaped* contain the Carrot, Parsnep, Long Radish and Beet; Salsify, Scoozonera, Rampion, etc., and should taper from the top gradually downward; they should be clean, having no forks, fibers, nor any unevenness. Color is of particular consideration in some of this class; in beets, a dark, bright, crimson; and in carrots, a rich orange, is to be preferred. All spindle-shaped roots, have not the same relative proportions of length to breadth, but there is a comparative unity; and the same general outline, with these exceptions, may be the guide.

The *napiform*, which includes the Turnep, Kohl Rabi, Swedish Turnep, Turnep Beet, Radish, etc., should be globular, smooth, clear in color, free from fibers, with the crown well up, and the collar of leaves very small. Although some of the best turneps, at present before the public, are flatted, it would be a great improvement, if the same qualities were found with a globular shape. There are several varieties, as the Snowball, Yellow Aberdeen, etc., that possess both properties, and which only require to be more generally known, to be fully appreciated. Whether globular or flattened, the crown should not be sunken, nor the substance stringy or pungent.

The *Bulbous* includes the Onion, Leek, Shallot, Garlic, etc., and the same general outline that is suitable to the napiform, will apply to these.

Those vegetables, the seeds of which are used in an unripe state, such as Corn, Peas, Lima Beans, etc., the pods or heads ought to be evenly and regularly formed, well filled, the seeds equal in size, young and fleshy; a bluish green, is a point of excellence in the pea family, and a rich sweet flavor, the best property both in peas and corn. Bunch Beans, Scarlet Runners, and all those in which the pod is eaten, should not have the seeds much swollen; the pod ought to be brittle, crisp, well formed and even, the more succulent and rapidly grown the better.

The superiority in Cauliflower and Broccoli, is close heads, a little elevated or rounded from the outside, toward the center; a circular outline on the base, and excepting in the purple or sulphur-colored varieties of broccoli, to be white and free from spots. In Cabbages and Lettuces, the heart ought to be close, solid, crisp, tender, not burst, nor old; of a white color inside, with the leaves neatly incurved, and pressed closely over each other.

In Celery, the whole plant, (roots included,) should be shown; these ought to be cleanly washed; the blanched portion to be quite white, if it be a white variety, or whitish pink, if of a red sort; this color extending upward, nearly to the top, the stalks to be solid and crisp, not spongy or hollow. A good head of Celery should weigh from five to eight pounds, and one half should be bleached. In this instance, and in all others where vegetables are used in a blanched state, the bleaching ought to be perfect, but

not carried so far as to render the plant watery or insipid. How seldom we see or hear of Mushrooms being produced artificially. This is much to be regretted, for they can be easily and cheaply grown, and are a very desirable accompaniment to other dishes. The best state of this edible, is before the cap opens out flat, and while in the 'button' form, when they are more tender, and the flavor is not so coarse, as if old and black. If too large, they are not so handsome,—a good specimen may be from two to three inches in diameter, with a nicely-rounded and close top, the substance fleshy and brittle.

Cucumbers of the best kinds have not hitherto been sufficiently valued, many persons thinking the short and prickly ones the best; nothing can be more erroneous, for some of the long sorts are as much superior to those so commonly seen in the market, as the mellow apple is to the acrid crab. A first rate cucumber should be young, quite straight, and even in thickness from end to end; with very short, thick neck, the diameter nicely proportioned to the length, not shorter than eighteen inches, and covered with a fine powder or bloom, a bright green color. It is immaterial whether it be spined or not, but the spines ought to be evenly scattered over the surface. A point or two might be sacrificed in favor of a young fruit, on account of superior crispness and flavor, while in that state.

Much as the Tomato is valued, we have but few varieties approaching to any real merit, and these might be improved. The Burlington is perhaps one of the handsomest; in form and color it is very well, but the skin is thick, and it is often hollow; by care and attention in seed saving, a race of far superior quality might be obtained, of which I have already had some proof. The main excellence of a tomato, is an even and rounded surface, in form like a pippin apple, well filled inside with a pleasant subacid pulp,—a hollow tomato should always be discarded,—the skin must be thin, and the color clear; a bright red is preferred, and is certainly most to be regarded.

It is desirable in Squashes and Pumpkins, that the flesh be solid and particularly well flavored; all points ought to be sacrificed to these two requisites. Were this more attended to by the awarders of prizes at exhibitions, instead of encouraging size so much, we should soon have a far better quality than what is mostly to be procured at present.

The Globe Artichoke, is a vegetable to which we may call attention. This is a plant of the easiest culture, but excepting in the more Southern States, it requires earthing over in winter, as a protection against frost. It is a very desirable vegetable, and ought to be more generally cultivated. In a good Artichoke, the outline of the head should form a globe, inclining somewhat toward egg-shape, with the scales thick and fleshy; and it is best for cooking when something advanced in size, but still young, and the fleshy part tender.

There are some other kinds of esculents, which are well worthy of cultivation; but what are enumerated above, are sufficient to serve as a guide, in determining first class vegetables. In making these observations, my object is to draw attention, to a too much neglected standard of excellence in this respect, for fine as many vegetables are, which are brought to our markets, and grown in private establishments, there is much room for improvement, and if I have contributed a mite, toward the onward progress of the art, my end will have been obtained.

W. Chorlton,
Gardener to J. C. Green, Esq.
New Brighton, Staten Island, N. Y.

California Strawberries.— The strawberry is indigenous to this region, and the hills in the vicinity of this city and the shores of the Bay, are now covered with supplies of that delicious berry in its wild state. The soil and climate of California are especially favorable to its cultivation. We saw a few days since among a lot of these berries growing spontaneously upon our hill, picked in the vicinity of the Old Fort, some remarkably large, luscious and finely-flavored berries. Under proper cultivation these native plants are no doubt susceptible of great improvement, and there is no doubt but that the fine varieties under cultivation in the Atlantic States and England, Hovey's and Keene's seedlings, and other varieties would succeed better here, than even where they are now grown with so much success.

The Orchard.—Why do you plant one?

IN considering the subject of Orcharding, and especially the *Apple Orchard*, the first question I always ask the applicant for advice, is, why, or for what special object do you plant? Do you propose simply to supply your own domestic hearth and your table with one of the choicest blessings of enlightened Pomology? Do you intend to produce food for your animals of different kinds, as an aid or substitute for grain, or, perchance, to enable you to keep more cattle than you can well supply with grain from your steep and comparatively barren hill-sides? Do you desire to compete with the vigneron, in the production of a pleasant beverage, by planting an extensive cider orchard? Or do you design to produce apples to ship away for sale in a more or less distant market? Upon the character of the replies to these questions will depend the nature of the advice that is to be given. Let us consider each of these propositions in order, first premising that the subject will probably prove an extensive one, that may require a second sitting for its elimination.

First, then, the *Family Orchard* will claim our attention; and a word of caution may be uttered at once, which may well be remembered in all orchard planting. It is a very common mistake to plant too many varieties; this is especially the case with home orchards, and here it is most likely to occur; we are all of us apt to select generously, rather than judiciously; few men, indeed, are capable of making out a select list of trees that shall bear a succession of fruits for the table and kitchen, so as to have a constant supply during the year—such a selection requires a pretty thorough knowledge of Pomology, and great familiarity with the varieties, and their adaptation to different soils and situations; then, again, much depends upon these latter circumstances, which will vary, and of which the results cannot be well predicated, *a priori*, but must be deduced from practical observations, drawn from long and judicious observation and experience.

more excuse for a large number of varieties,

In a FAMILY ORCHARD, I have said, there is than in one planted for almost any other purpose, and yet, for a single family, a dozen trees should furnish a great superabundance of fruit. Now, who will give us a select list for the year through, with no more than twelve varieties? It may not appear to be a difficult task to the tyro, but the observation of all who have attempted such a selection is, that the smaller the list to be chosen, the greater will be found the difficulty in making the selection. Let us try a suite of one dozen trees, commencing with the earliest: I should begin with the Red Juneating, Prince's Harvest, Summer Rose, Fall Pippin, Rambo, American Golden Russet, Newtown Spitzenberg, White Bellefleur, Swaar, Pryor's Red, Rawle's Janet, Newtown Pippin.

Another would prefer, White June, Benoni, Strawberry, Golden Sweet, Fall Pippin, Rambo, Westfield Seeknofurther, Newtown Spitzenberg, Yellow Bellefleur, Waxen, White Pippin, Roxbury Russet. While another would consider no list perfect without the famous keeper, Gilpin, which, he will tell you, is more easily kept over than any other variety, and that you have only to shake them down, shovel them up, and hole them away in the earth, like potatos or turneps, and open them for use next April or May. Alas! there is no accounting for taste—some people think the Gilpin unfit for the table, at any time. Would you plant

FOR MARKET, the question assumes a new phase altogether, and the answer is made by asking, for what market will you grow your fruit? for it is a matter of great importance to furnish a supply that shall suit the tastes of your customers, and the consumers are possessed of as much diversity in this respect as in any other; and withal, are coming rapidly within the influence of the enlightening rays of those bright luminaries, the Pomological Conventions of the States and Nation; although still bound by fashion and early association. Thus, in New England, the Porter, Baldwin, Rhode Island Greenings, Westfield Seeknofurther, and Boston Russet, will outsell most other varieties. In New York, the Greening, Esopus Spitzenberg, and the Newtown Spitzenberg, (their Vandervere), the Newtown Pippin, and the Yellow Bellefleur, will bear the palm; and in Philadelphia, another style of fruit would

command more attention, among which the Rambo would stand pre-eminent; and the beautiful little Lady Apple, which constitutes a necessary part of the Christmas decorations, and the ornaments of every winter feast, will receive the highest price of any other Apple in either of those cities.

In the Southern markets—to which vast quantities of the products of our Western orchards are shipped by river—all red apples are preferred to those of lighter color. The warmth of the climate also requires that the fruit should be of the firmest and best keeping varieties; hence we find that the Pryor's Red, the Rawle's Janet, and even the Gilpin, are favorites among the shippers and purchasers, who will almost at once reject all of the light-colored fruits. One reason for this, however, is, that such varieties appear badly when they are attacked with the clusters of lichens that sometimes discolor the skin of apples grown in our rich soils, especially on low lands, and which shows most distinctly upon the lighter ground-color of green-skinned apples.

But we have not done with the market question. The considerations just mentioned relate entirely to the distant market, and refer to the selection of winter fruits. Near our large towns and cities, and particularly in the vicinity of railway stations, a very large supply of choice fruit is wanted for the retail trade, throughout the season, unless when interfered with by the appearance of choice pears, or the more uncertain peaches. The keepers of fruit-stands and the retailers upon the rail-cars, desire fruit that shall be attractive, and pay much less regard to real excellence than to external beauty—so that it may be profitable to produce a supply for this demand, that may not rank as first-rate, but realize to the producer the highest prices. Thus, for this purpose, the beautiful Maiden's Blush, which can scarcely be ranked as *good*, will be purchased readily, while other and better sorts remain unsold. The Waxen will follow after this, fruit, and be eagerly sought, on account of its appearance; the Yellow Bellefleur always commands a high price, though not admired universally as a dessert fruit.

The peculiarities of the HOTEL demand, require special consideration; some orchardists wonder, that their magnificently large and fair fruits, should be passed, by the caterer for the Burnet House, or an Astor, or other first class hotel, who will stop at the next supply offered, and make liberal purchases of an inferior and smaller fruit at a fair price. The hotel keeper will explain this matter by telling you, that in purchasing he has two objects in view, the decoration, as well as the supply of his table—he cares less about the quality than the appearance of the fruit he purchases. He may also slyly suggest, that, as every person who occupies a seat at his table, has a right to help himself to what is before him, and no one thinks of dividing an apple with his neighbor, and that what he leaves is wasted, therefore the landlord can better afford to purchase small sized fruits, even at a higher price per bushel, than the largest and most handsome ones, at a lower price.—Thus, for a dinner of one hundred plates, it is cheaper to pay one dollar for a bushel of neat, medium-sized, or small apples, containing one hundred specimens, than to give one dollar and a half for two bushels of the finest and largest fruit of the season, that shall count but one a-piece for the party. This matter of calculation is beginning to be well understood, nor is it the tavern-keepers alone, but private families also find it to their account to select medium-sized fruit, independent of the fact, that most of the apples of the highest character are not large. The best dessert fruits are of medium-size, although many of the large kinds are good for the table, and may be much preferred for the kitchen. While the retailer of the fruit stand, or the confectioner for his show-window may pay a liberal price for the largest and most showy kinds, even if they be of indifferent quality.

From these remarks, it will be inferred that it is important, before setting out an orchard, for profit, to determine whether the demand to be supplied be near at hand, and requiring a supply through the season; and also, whether it be northern, eastern or southern, or even beyond the seas, since each will require a different selection of varieties. As a general remark, applying to the planting for any distant market, it may be premised,

that it is safest to select *very few varieties.* Whatever be the preferences of your customers, determine another question of the greatest consequence to your success,—that is, the varieties that have proved successful, in your particular neighborhood—for it has long since been observed, that the finest fruit of one region, may become quite an inferior affair in another, nor can any one determine this point, beyond a general guess, without absolute observation or trial—similarity of soil and situation will be a pretty good indication; but exceptions will be found when a remarkable similarity exists—a great change of latitude is almost sure to make a difference in the fruit, especially if from north to south. A change from a somewhat sterile soil, to one of great fertility, is generally followed by an increase of size, but often, also, by a greater coarseness, in appearance at least. So remarkable is this, that pomologists are often puzzled, in recognizing fruits produced in our region, although they may be perfectly familiar with the same variety at home.

Having rejected from the lists before you, all those which have not been thoroughly tested, in the soils and localities wherein you would plant; and having determined upon the market you intend to supply, and made yourself familiar with the character of the demand of that market, you have little to do but to gratify your fancy by choosing a few varieties, say four or five, of such as will make the healthiest and prettiest, and most durable trees—for some kinds will prove much more permanent, and will make much more handsome trees than others; while, on the other hand, it has been observed, that, from whatever cause it imports not now to examine, some trees are much more liable to suffer from climatic influences, blight and other causes, which are resisted by other kinds, standing beside them. This is especially an important question to the planter in Illinois, and perhaps all the north-west fruit region, where much valuable information has already been collected, by the intelligent pomologists, from whose notes and suggestions I shall shortly prepare a list of varieties most subject to injury by cold and blight.

To close this part of the subject, it must not be forgotten that England furnishes an excellent market for our apples. We are told by travelers from this country that these fruits, grown in Great Britain, are generally inferior. There is one variety, so far as the trade has yet been tested, which will pay well for transportation; it is so generally selected for the English market, that it is known there as *The American Apple*, and here known as the Newtown Pippin, so familiarly, that it need only be named. Mr. Pell and other orchardists, have found that this is the best variety for shipping, on a long voyage, and others may safely rely upon their experience; but by all means ascertain before planting, that your soil is well adapted to the variety, for in some sections this Newtown Pippin, does not succeed so as to be profitable. As a general rule, it is claimed that this tree should have a rich calcareous loam, but the subsoil should not be too tenacious and wet. To recapitulate—for a distant market, select a few varieties, adapted to the demand, and be particularly careful to discover whether the sorts be adapted to your soil.

Sweet Apples for Stock.—The growing of apples as a food for stock, has within a few years attracted much attention among the most intelligent agriculturists; and pomologists have been engaged in selecting lists of such as were most hardy, productive, and ripening in succession. Those who have tried the most experiments in the use of this kind of food, speak in the most exalted terms of the results. Some assert that an acre of land properly set in sweet apple trees, at ten years of age, will feed more pork than an acre of corn; this will be especially true, in a region that is not recognized as a corn country—many hilly places that are unfit for tillage, will produce remarkably fine apple orchards; indeed, it is generally conceded, that a broken, hilly country, is better adapted to orcharding, and more certain in its crops, than any other more level and fertile. Some very thin soils, are found to produce thrifty trees and abundant fruits.

The following sorts of sweet apples are

recommended for a succession of fruit for stock feeding; they are particularly selected for their hardiness and productiveness, and are offered with the restrictions and provisos already noted.

Sweet June,	Ramsdell,
Sweet Bough,	Danvers Winter,
Golden Sweet,	Talman's Sweet,
Jersey Sweet,	Michael Henry,
Bailey Sweet,	Campfield,

and any other local varieties that have been well proved in their several neighborhoods.

For a Cider Orchard—there are several varieties that have been fully proved to be superior to most others—they should be of thrifty growth, very productive, and should ripen late in the season. It is a great mistake to suppose that any common apples will answer for the manufacture of cider.

The varieties that have been found most desirable for this purpose, are those which contain the most saccharine principle, and which will yield the heaviest must; they are not, however, necessarily sweet apples—such are the Harrison, Campfield, Graniwinkle, Gilpin, and especially the Hewes' Virginia Crab. Several others, on account of their hardiness and productiveness, are frequently planted for cider orchards.

The selection of a succession of apples for an orchard, for general purposes, was a topic that furnished much valuable discussion at the meetings of the Cincinnati Horticultural Society, during last winter, at which time, I prepared the following report:

The Fruit Committee feel the difficulty of the task assigned them, of selecting ten varieties of apples, for an orchard of one hundred trees, to be planted in this vicinity; their general properties and adaptation to all purposes being considered. So numerous are the varieties of this favorite fruit, which are claimed to be superlatively good, and so varied are the tastes of the public, which must be consulted, that the difficulty of making a selection is greatly increased—beside this, we are confined in our report, to those which have been fully tested *here*, and shall be obliged to throw aside the claims of many which may have impressed themselves upon our palates, with a most agreeable smack, and which enjoy the prestige of high names and superlative local characters, because we have not sufficiently tested them in this region. The following are, however, reported:

For July and August........2..Summer Rose;
" July and August........3..Strawberry;
" September and October,..2..Fall Pippin;
" October and November...4..Rambo;
" November and December.6..Golden Russet;
" November and December.5..Newtown Spitzenberg;
" November and December 20..White Bellefleur;
" January and February..15..Pryor's Red;
" February to April......40..Rawle's Janet;
" March................ 5..Newtown Pippin.

100 trees.

It was moved to amend, by increasing the number of Newtown Pippin, by reducing that of the Rawle's Janet, so as to be 25 to 20. Carried by the casting vote of the Chairman, George Graham.

And then, that the Yellow Bellefleur be substituted for the Vandervere, or Newtown Spitzenberg. Carried.

Potash and Soda in Plants.

Professor D'Aubeny has read to the Chemical Society, a Paper "On the Variation in the relative Proportion of Potash and Soda present in certain samples of Barley, grown in Plots of Ground artificially impregnated with one or other of these Alkalies." The author detailed some experiments undertaken by him at the Oxford Botanic Garden, with the view of determining whether the usual quantity of potash and soda existing in barley, might be made to vary, by causing the plant to grow in soil impregnated with more than the ordinary quantity of one or the other of these alkalies. He found that when the barley had grown in a soil which had been dressed with a strong solution either of carbonate of soda, or of chloride of sodium, the ashes of the plant contained about eight per cent. more soda than was present when the plant had grown in a soil impregnated with carbonate of potash, or left unimpregnated. The difference may admit of explanation, by supposing one alkali capable of replacing the other, within the organism of the plant; but the author thinks it more probable, that it arose from the sap circulating through the plant at the time when it was cut, containing in the one case, more soda than it did in the other. The saline contents of the fluid of the sap would of course be confounded with those which have been actually assimilated by the plant; and hence, from the variation in its composition, must tend to modify the amount of the alkalies obtained from the ashes of the plant in each instance, according to the nature of the material with which the soil had been impregnated.

Special Manures for the Vine.

ANALYSIS.

DR. WARDER:—The reappearance of your Horticultural Review, gives me great pleasure, and I doubt not it will be heartily welcomed by all Horticulturists, and many Agriculturists; it is their treasury, wherein they can deposit the results of the trials and experiments which they have made; here they can discover what trials have been made by others, and thus verify the latin adage, *docendo discimus*—by teaching we learn.

My hobby-horse is the Vine, and its product, Wine, and in this article, I propose to treat upon MANURING THE VINEYARD, as I have been often called upon to explain my method, and because the quality of my wine has given ample proof of its value, as the best adapted to our soil.

I hope the tendency and character of your Journal, will continue to be the same as heretofore; that it will ever be open for the reports of all practical and scientific experiments—such as shall promote the best interests of the Western Farmer and Horticulturist; nor do I apprehend, that it will be swayed by any one-sided views.—You have ever advocated the doctrine of associating "Temperance and the Vine;" and in this you have many to agree with you, who look to the vine, as the right arm of progress in this direction.

That we may be able to form a correct notion of the suitable manure for the vine, I shall append below, two Tables, showing the constituents of the plant and its products.

No. 1, exhibits the organic and inorganic constituents, the former consisting of oxygen, carbon, hydrogen, and nitrogen, furnished by the atmosphere, and the latter, taken up from the soil, by the roots, and deposited in the fruit, shows the quantity found in the sweet juice, expressed from the grapes, yielded by 2000 vines, growing on one acre.

No. 2, gives the quantity of inorganic substances, assimilated by the leaves and wood of the same number of vines on an acre.

TABLE, No. 1.

Organic Parts.	*lbs.*	*oz.*	*dr.*	*grs.*	*lbs.*	*oz.*	*dr.*	*grs.*
Tartaric Acid	10	10	2	24				
Grape	1	11	1	36				
Malic	7	3	2	24				
Gum and Dextrine	16	8	6	40				
Crystallizable Sugar	627	13	4	36				
Tannin		9	2	48				
Gluten and Albumen	41	15	0	40	706	7	5	8
Inorganic Parts.								
Phosphoric Acid	1	15	1	12				
Sulphuric "	1	1	1	62				
Muriatic "	1	2	0	0				
Potassa	5	6	2	8				
Soda	3	4	1	28				
Lime	4	0	0	6				
Magnesia	2	0	0	32				
Alumina	0	14	6	24				
Oxide of Iron	2	7	0	0				
Silex	2	6	3	12	24	9	0	48
Water					3268	15	2	4
Total lbs.					4000	0	0	0

TABLE, No. 2.

Two thousand vines on one acre, producing each 4⅙ lbs. of wood and leaves, or 8335 lbs. which, when burned leaves 6 per cent. of ashes, or 500 lbs. which consist of:

	lbs.	*oz.*	*dr.*	*grs.*
Potassa	60	2	0	36
Soda	17	13	1	34
Lime	150	11	4	46
Magnesia	46	5	6	4
Oxide of Magnesia		13	7	30
Phosphate of Iron	12	5	0	51
" Alumina	5	0	4	26
" Lime	46	3	4	25
Sulphate of Lime	10	4	5	20
Salts	8	8	5	18
Silex	16	2	2	30
Carbon, Carbonic Acid, and Sand	125	8	4	50
lbs.	500	00	0	00

Hence we see that each acre loses annually:

By the Juice, ... 5½ lbs. of Potassa.
By the Skins and Seed, ... 7½ " "
By the Wood and Leaves, ... 60 " "

Total .... 73 lbs. of Potassa.
Also .... 77 " of Phosphates.

The question arises: Do these necessary salts exist in our soil in sufficient quantity, and, further, are they returned to it in the common method of manuring? We must answer in the negative. It is true, that our shelly limestone contains both these salts, but it is not disintegrated with sufficient rapidity, to restore the quantity annually removed, and hence, an ultimate deficiency must occur.

By our old method of manuring every third year, with stable dung, we stimulate the vines, to produce an over-crop, which, for want of these necessary salts, cannot perfectly ripen, and, as a natural consequence, we have bad wine. Most of our vine plant-

ers have found the advantage of adopting a rotation of crops; even with manure, it was observed that some crops diminished in their yield, when they were grown upon the same land for several consecutive years, but when a change of crops was introduced, even with little manure, full returns were obtained. The richest soils will soon be exhausted by the continued production of the same crop, as has been abundantly proved in the tobacco and cotton growing states. Rotation of crops is impossible for the vine crop; to obviate this difficulty, and to secure a certain and good crop, I turn all the leaves under the soil; the waste wood is either cut up, or burned, and returned to the earth. In the early spring, I apply, annually, to each acre, two barrels of bone-dust, or burned oyster shells, one barrel of wood-ashes, mixed with half a bushel of salt and plaster of Paris—the last may be obtained from the soda-water maker, for a trifle. In addition to these inorganic special manures, I apply every few years, a dressing of old decayed stable manure, to restore to the soil, the exhausted humus.

L. Rehfuss.

Grape Culture on Kelly's Island.

The soil of Kelly's Island, consists of a few inches of vegetable mold, resting on a subsoil of hard clay, in which is mixed some pebbles and sand, mostly of limestone, and, occasionally, crystals of sulphuret of iron, are found.

When the whole are mixed by plowing, they make a pretty stiff soil, well supplied with lime, sulphur, and iron, and yield heavy crops of wheat or corn. Most of the Island is nearly level, or having a gentle slope, just sufficient to carry off the surface water.

Where grape vines are planted, the ground is subsoiled eighteen inches deep, and underdrained. The first planting of grapes was in 1842 or '43, when a few Isabellas were planted in gardens. The Catawba was introduced two or three years later. The unusual growth of the vine, and superior quality of fruit, attracted the attention of persons acquainted with their culture, and generally elicited expressions of surprise, and induced several persons to engage in the culture for the sale of fruit and wine-making.

In the spring of 1851, the writer set out part of a field where corn or wheat had been raised for five successive years. The ground was subsoiled, and underdrained. Layers and cuttings, each one year old, were used. In February 18, '52, the growth was cut down to two and four inches from the ground.

From one to four shoots were allowed to grow, according to the strength of the plant. The side shoots were picked off twice in the early part of the season; in all from three to five feet from the root, after which, all were allowed to grow. Now some of the Isabellas have two shoots, each eighteen feet long, others, four shoots, each fourteen feet long, by actual measurement.

Some of the Catawbas have two, others four shoots, ten feet long each, of wood well ripened nearly to the ends. No manure of any kind has ever been put on this field, except some leached ashes on one corner, and that does not appear to have increased the growth at all.

The yield of fruit has been uniformly heavy, until the past season, when the vines were injured in many places, by the severe winter of '51–'52, and again by long continued and heavy rains, while in blossom. The quality is fully equal to that grown in the most favorable part of the country. Specimens were exhibited at the State Fair held in Cincinnati, October, 1850, and the examining committee unanimously awarded them the first premium; and many cultivators of Hamilton county, said they had never seen so fine ones before.

Mildew is sometimes seen on the Isabella, but never yet on the Catawba. The rot, so troublesome in many places, I have never seen but once; when a few Isabella vines were slightly injured by it.

The training here is entirely on trellis, some made of wood, and some of wire. That of wire is made thus: Set posts 25 feet apart, bore half-inch holes at suitable distances; if for three wires, say 20, 40, and 60 inches from the ground; or if for four wires, at 18, 32, 46, and 60 inches. Then draw in annealed wire, No. 9, the whole length of the row of posts, letting the end come through the last post about four inches, drive in a half-inch pin of hard wood from the outside, and give the end of the wire one turn round the pin close to the post. Then from the other end draw the wire tight, and fasten as before. The end posts should be set firmly, and are better with a brace from the inside.

No. 9, annealed wire, of good quality, I have bought in New York, for four and a half cents per pound. It weighs just one pound per lineal rod. Wire trellis is put up very rapidly, and costs less than half as much as wood, and is more convenient for

training grape-vines than anything else I have ever seen.

It is better, also, for the fruit to grow on wires or bars, where the clusters can hang singly, and have the full benefit of the air, than to hang altogether, in one bunch, as they do where a hoop is made, and tied to a stake.

A little wine has been made for the last three years; but only for experiment and home use. Few of the vines in the field have borne yet, and the fruit, bringing a good price in market, has been sold. What has been made, has been pronounced, by good judges, to be of the first quality, and that, too, when made from young vines, and without experience. And it is believed, that our superior fruit will, with proper management, make superior wine.

One proof of its quality is, it will keep until May, or June, without decaying. I once put a bushel in a basket, covered with a sheet of paper, and set the basket in the cellar, on a barrel of apples. In March, they were sound and fresh, and in better condition than the russet apples.

The influence of the Lake has a marked effect on our vegetation. In the spring, when the water is cold, retarding it, and at the same time, preventing late frosts. Indeed, we never have a frost in the spring, after tender plants have started. In sixty years, that peaches have been grown here, by squatters and others, it is not known that they have ever been injured by a spring frost.

In the fall, the water retains the warmth acquired during the summer, sufficient to extend our season considerably beyond that of the main-land, at a distance from the lake. We never have a frost before the 20th of October, and often not until much later. The first, this season, to do injury, was Nov. 13th, when the thermometer fell to 28 deg., until which time, peppers and tomatos were untouched. A little white frost had been observed before, in some localities, but not sufficient to do injury.

The severe drouths of summer, are considerably mitigated by the moisture arising from the lake, while, at the same time, fogs, so destructive to the grape leaves, are of rare occurrence, in summer or autumn.

Nov., 1860. CHAS. CARPENTER.

This elysium of the fruit-grower, has been noticed in brief manner, at a previous writing, and the happy immunity enjoyed by the cultivator, from late spring, and early autumnal frosts, has been already mentioned. I am glad, however, to present the reader with a statement from the last Agricultural Report of Ohio—a work to which we should look with pride, and always with a certainty of meeting with statistics of our State, and its products, that should cause us a thrill of patriotism. Kelly's Isle, is situated a few miles from the southern shore of Lake Erie, directly north of Sandusky Bay.—*Eds. Bot. Mag.*

The Ground-Nut.

WE are told in the daily papers that the trade in ground-nuts has become one of very great importance in Western Africa, the barbarous tribes there having taken to cultivating their land, instead of occupying themselves with slave-hunting. It is said that 900,000 bushels of this commodity have been received in the present year; that the trade has increased of late at the rate of 20 per cent. per annum, and that the amount is still rising. What, is the Ground-nut, thus suddenly risen into such importance as to attract the serious notice of merchants?

The plant which produces it is a little annual, with oblong leaves growing in fours, and rather large yellow Pea-flowers rising a little way above the ground. Botanists call it Arachis hypogæa. The plant is one of a class which bury their pods in the earth, when they ripen, instead of raising them into the free air. In order to effect this, the flower-stalk, after the flower has passed away, gradually curves downward, and at length forces its end perpendicularly into the soil, along with the very young pod which is seated there. Having buried itself sufficiently deep, the pod then begins to swell, and when ripe, becomes an oblong, rugged, pale brown fruit, containing about two seeds, as large as the kernel of a Hazel nut. Such pods are common in collections of unusual fruits; the French call them *Pistache de terre*, in allusion to their resemblance to Pistachio nuts.

At the present day, the Arachis is found in a state of cultivation all over the hottest part of the tropics. It is, nevertheless, almost certain that, like Maize, Tobacco, and Pine-apple, it was unknown till the discovery of America, and that every region in the old world where it is now grown, owed it to Brazil. So that we have in this plant a further example of the rapidity with which vegetables will take possession of soils when the climate is suitable.

Sometimes the Arachis is eaten; but we agree with M. Poiteau, who has lately published an account of the plant, in regarding it as a very indifferent variety of the nut kind, whether raw or roasted. Its great value is caused by the abundance of oil which it contains. Olive oil, largely employed in dress-

ing woolen cloths, has become too dear for manufacturing purposes. Olive trees have of late years been unproductive, and are disappearing from some of the Italian states; they are now, moreover, reported to be attacked by some kind of mildew, so that a good substitute has become a matter of first necessity. Such a substitute has been found in Ground-nut oil, or oil of Arachis. According to Dumas, it was a house at Marseilles that first thought of importing this substance. Eight or ten years ago, four or five kilos were imported by way of experiment; and so great was the success which attended it, that in 1852 the imports into France amounted to the enormous quantity of seventy million kilos, (about 70,000 tons), a figure beyond even that of sugar.

We know little of the cultivation of this plant, except that it requires a temperature much above that of any country north of Lyons. According to Girardin and Dubreuil, it requires a good, alluvial soil, or even sandy land which is well watered, and has been heavily manured. In the month of May it is dibbled in lines, so as to leave the plants a foot apart in all directions. As soon as the flowers appear, the plants are earthed up, and this is continued as long as growth continues. When the temperature falls to 58°, the Arachis ceases to grow; its leaves turn yellow, and it may then be dug. Each acre should yield about half a ton of seed. These produce from thirty-four to sixty per cent. of good oil, fit for burning or for cloth-dressing, but not eatable. The cake is very rich in nitrogen, and makes excellent manure; but it is poor in phosphates.

We notice the plant thus at length, in the belief that it may prove a profitable crop in all our tropical colonies where there is moisture enough to suit it. In Spain and Algiers it is found to rank among the more advantageous objects of field cultivation.— *Gard. Chron.*

The Preservation of Salads in Winter.

This constitutes no mean portion of the gardener's art, and requires a very just appreciation of those principles which have a tendency to arrest or ward off decay in the vegetable world. To say that a good salad bowl is a welcome addition to the dinner table, at whatever season, is no new tale; so much is it esteemed, that even the most unfortunate dyspeptic must frequently sigh when he sees this delightful accessory and may not partake of it. The principal salads that we have to consider are as follows: Celery, Lettuce, Endive, Radishes, Cresses, etc.; a few others there may be, but they claim but little consideration. I will endeavor consecutively to offer advice to the uninformed.

Celery.—The larger and grosser Celery is at the approach of winter, the more difficult it is to preserve, and the more liable to "run," or to "bolt," as practical men term it. Here, then, is an argument in favor of at least one portion of the celery being late sown, and grown quickly, as advised in my former paper. I have known the remainder of plants left in a seed bed—not having been required at the "pricking-out," time—stand hard winters unharmed; while that in the bed, or rows, was nearly destroyed during a hard winter; albeit, the latter was duly protected.

By whatever plan, or at whatever season, Celery is grown, it is absolutely necessary that it be kept dry at the root in winter; and, I may add, in the foliage too, if possible; the latter, however, is not easily accomplished without too much expense, or ill-spared labor. Those who suspect wet at the root, therefore, had better, as a beginning, take instant means to carry off this water. Draining, of course, will at once occur to the mind; but in many cases it is not necessary to have recourse to it; and, as it is quite necessary, some time in November, to soil or earth all Celery as deep as possible, in order to keep out frost; and such being practiced, it will be found, generally, that the excavation of soil rendered necessary, will, of itself, give relief to the superfluous moisture. In earthing-up for the last time, our practice is to press the soil as close to the plants as possible, as this not only keeps out frost to a degree, but prevents slugs, or other depredators from entering readily; it also, of course, facilitates blanching to a higher level.

Everybody knows that Celery is liable to be defaced by the slug, which, as I take it, is the greatest pest of the plant. We have been in the habit of applying slacked lime for many years in order to destroy these rogues, or set them at naught, and with unvarying success; for it is seldom we have suffered from their ravages, although our quarter is famed for them. The lime is applied when the celery is about half grown, and is dusted liberally on each plant. But about winter matters. Celery, as to protection, requires very similar care to the rest of our half-hardy things, for so I must call it. My practice is to cover with long, loose, and dry litter, on the first severe frost, say one in which the thermometer went down to 24°. The ground is, of course, frozen hard, and this is necessary; for if covered up with the design of entirely keeping out frost, it would soon become, if the frost was of a protracted character, doubly tender. Covered up in a frozen state, we endeavor to keep it from the fluctuations of any temporary thaw. for

doubtless these do more harm than anything else. Indeed, these maxims will be found to apply to almost any description of plant, which, although somewhat tender, is required to stand out-of-doors altogether; even to our half-hardy shrubs. We have had Celery beds thus covered for several weeks, without any harm that we could perceive. It sometimes happens that snow falls before we can get our cover on; this we heed not, but regard the snow as part covering.

LETTUCES. — These are far more difficult to protect than Celery; they are more tender in a blanched state, being, of course, unprotected with soil. Pits, or frames, are the best preservators, but few can spare them. In the open ground it is a good plan to have plenty of highly-grown *Brown* or *Bath Cos* of full size by the end of October, and then to take them up with good balls of soil, and place them in a close row under the garden walls, touching the latter. Here they may be covered readily with plenty of dry litter, and in very severe weather a board may be placed before the litter, sloping from the wall, to throw off rains and snow. Another plan is, to knock up an inclosure, surrounded by slabs, and so constructed as to receive old spare lights, shutters, doors, or anything of wood that will exclude wet; here the Lettuces may be inserted thickly together, with their balls entire, and covered at night, and in severe weather. Those who resort to such plans should tie the Lettuces slightly before removing them, as they move safer, and pack more closely together. As soon, however, as they have been taught to avoid elbowing each other, the bands of those wanted to keep some time may be cut; for if blanched, they will, of course, not keep so so long. Where huge *Bath Cos* Lettuces are to be met with in the middle of October, they may be both preserved and blanched by inverting a garden pot over them. When it is desirable to attempt to preserve Lettuces in open situations, under ordinary culture, it is no bad plan to place pea-stakes among them, to sustain mats, which may be thrown over them nightly after the third week in October, or sooner, if the necessities of the season require it. In addition, they may, when slightly frozen, as the winter advances, have litter strewn over the mats, and be kept in a frozen state as long as possible. They will thus endure some eight or ten degrees of frost tolerably well, especially if kept dry.

And here another, and, indeed, complemental, procedure, becomes imperatively necessary; and the question of thawing comes in view. Every cook, from Soyer downward — and there are many grades — knows full well that judicious thawing is not an off-hand proceeding. All other things being equal, I should say that he was the best gardener who thaws his long pent-up and frozen vegetables the slowest. It must never be forgotten that it is a question of light, as well as of temperature. Living vegetables, although in a somewhat torpid state, somehow acquire a slight degree of etiolation (or blanching, as the gardeners term it), by being covered up some time; and the plant becomes impatient of sunlight. Every gardener knows that in summer time it is not judicious to expose to sunshine choice plants which have been a week on a journey, closely packed; and just so with vegetables. On the arrival of a thaw, therefore, after days — it may be weeks — of confinement, much caution must be observed; such things should not be uncovered until fairly thawed, and this will commonly be the case a couple of days after everything around them has been fairly influenced by the altered condition of the air; and when uncovered, it must be by slight installments, admitting light cautiously; this weaning process will, of necessity, occupy some three days.

ENDIVE.—Here we have a dainty subject to manage in the depth of winter; more so even than the Lettuce, for Endive is so liable to a gangrenous rot; is, indeed, more susceptible of damp, especially if in confined foul air; hence it has been a practice with many good gardeners to bury their Endive in dry soil, in order to avoid the vicissitudes of the atmosphere. There are so many ways of preserving Endive, that I need not enlarge on the subject here, any more than to observe, that those who have not pits or frames to plant a winter's stock in, should provide a lot of well-grown, full-hearted plants by the middle of October, taking care to protect them from the early autumn frosts; these may be tied to blanch in succession, bearing in mind that a continued protection is necessary. I have known such placed in a drill, close to the foot of a wall, after the manner of Lettuce, with very good success, and protected in like manner. Of course, those who can place quantities in pits or frames, and give them all the minutiæ of free ventilation, with proper protection when necessary, may have Endive all through the winter. There are, however, some secrets in Endive growing with our market-gardeners, with which I must confess myself not well acquainted; for I always find Endive quoted in our Covent Garden reports in the month of March and April; and this is what not one gardener in a score can boast of; and what is it that this celebrated market cannot boast of during the *London season?* But, then, the attention of such men is of a highly concentrated character; they have little of the daily fiddle-faddle of the general gardener to distract

their minds, the latter being like Gulliver among the Lilliputians, tied down by every hair of his head.

RADISHES. — Those sown in the end of September will be in use all the winter, if protected; and little of this they need. Nothing more is necessary than a straw covering, as alluded to in spring crops. These things may be drawn young all the winter, but few care to eat them after November, for, although delicate-looking, they are tough. Those who have a moderate temperature in a frame or greenhouse near the light, might sow a few in boxes, and introduce them in the beginning of November; they would, doubtless, be much more tender.

CRESSES. — Of these, the old *American* or broad Cress, is the most common, and is perfectly hard. The *Curled* is the finer flavored by far, as I think; and, indeed, the best Cress in the country, but it is slightly tender; sown on an elevated bed, in a warm situation, in the end of August, fine leaves may be picked through the whole winter. This must be protected, and being impatient of pressure, the covering should not be on it. A little framework may be placed over the bed, and mats stretched over it. In addition to the mats, a covering of litter should be added in severe weather.

I may now add, that many other modes of securing winter salads may be found among gardeners, many of them excellent, so that I by no means would have our readers *confine themselves* to the modes herein laid down, for I do not pretend to a monopoly of ideas on this subject; my desire is rather to direct attention to principles.

R. ERRINGTON.

The Cultivation of Liquorice.

BY D. J. BROWNE.

THAT the spirit of agricultural improvement is fully awake in this country there is no doubt, and its progress has been far more rapid within the last ten years than in any preceding period. Excited by the laudable example of the Old World, new Agricultural Societies have annually started up in numerous sections of the Union, and encouragement has been held out by these patriotic associations, which have been headed, for the most part, by intelligent and liberal-minded men, endowed with a real knowledge of rural affairs, whose attention has generally been directed to objects of practical utility. Prudently avoiding all uncertain or fanciful theories, and adhering to such only as have been confirmed by the sanction of actual experience, their endeavors have been attended with signal success, and such a forcible appeal has been made to the common sense of the country, as the rude voice of prejudice itself will be unable to confound. Yet, if a more enterprising spirit prevailed in our husbandry, in augmenting the number and the value of useful productions, we would no longer allow one system of industry to be promoted at the expense of another; and the ties of interest, which bind the extremities of our country, would thereby be cemented in indissoluble union. And how can these ties be more effectually strengthened than by the cultivation of Liquorice in the Southern States; Madder in the Western, and Venetian Sumach in the Eastern and Middle States? Large quantities of each of these substances are annually imported into the United States for the purpose of being employed in medicine or in the arts; all of which, by judicious enterprise, could readily be obtained by home production, and consequently would add thus much to our national wealth. The amount of liquorice annually imported into this country, is believed to exceed $250,000, and the demand has increased in proportion to the increase of our population, the establishment of new manufactures, and the multiplied uses which they have called forth.

Paper has recently been manufactured in France from liquorice-root, which is stated to be very white, and does not require any size in its preparation, while it can be manufactured at a price much lower than that made from rags. If this statement be true, the subject is one of considerable importance and is highly worthy of trial by the planters of the South.

The cultivation of Common Liquorice, (*Glycyrrhiza glabra,*) early attracted the attention of the colonists of Georgia and Carolina, and it was ascertained that the soil and climate were favorable to its growth; but, owing to the numerous other branches of industry, and an insufficient demand for this root, its culture never was much encouraged.

This plant is a tender perennial, with roots extending very deep into the ground, and creeping to a considerable distance. When full grown, they are as thick as the thumb, round, slender, flexible, and furnished with a few scattered rootlets; of a yellowish color externally, succulent and fibrous within. From the root proceed three or four erect, herbaceous, pale green stems, four feet and upward in height, garnished by alternate, pinnated leaves, having yellowish green leaflets, clammy on their under sides. The flowers are small, papilionaceous, of a bluish or purplish color, and are succeeded by oblong, smooth, compressed,

pointed, and one-celled legumes, containing two or three small kidney-shaped seeds.

The soil should consist of a moist, loose, sandy loam, or the black mold of the alluvial or bottom lands, situated near our southern lakes and streams. In short, the fresher, newer, and richer the ground, the better for the plantation; and if not sufficiently rich, it should be made so by adding a due quantity of rotten stable dung, mixed with plaster or charcoal, and wood-ashes or lime, in order to rot it the more, till deprived of its fermentative heat, which would otherwise injure the runners or sets. The ground should be subsoiled or trenched three or four feet deep, and, if sufficiently rich, thrown into three and a half foot beds, including the alleys, in the centers of which the sets are to be planted early in March, at intervals of eighteen inches apart; but if the ground is not sufficiently rich, trenches must be dug throughout the field, three and a half feet apart, from center to center, wide enough, at least, for a man conveniently to work in, and three or four feet deep. When one trench is dug, it must be filled with the earth from the next, well incorporated with the dung or compost, and alleys made seven or eight inches deep, midway between the trenches, the earth being spread over them, so as to form raised beds throughout the plantation.

In the next place, the runners, or sets, are to be provided, which consist of those sprouts that proceed from the thick ends of the roots, or crowns, of the plants, usually lying about two inches below the surface, and are three or four feet in length. These small running roots are to be cut into five or six-inch pieces, with two or three eyes, or joints to each piece. Another kind of sets consists of the tops, or crown-buds, which are cut from the liquorice-roots at the time of harvesting. When the sets are in readiness, dibble holes along the centers of the beds, eighteen inches apart, and seven or eight inches deep, into each of which thrust a piece of root, with the small end downward, covering it entirely with mold. If crown-buds are used, they may be treated in the same manner, with the exception of dibbling the holes less deeply. During spring and summer, all weeds must be kept down by the hoe, care being taken not to cut off the top shoots of the plant, as it would greatly injure them. In the Autumn, when the stems of the liquorice are in a decaying state, they should be cut down, and a light dressing of rotten dung spread upon the surface. The following spring, say early in March, the ground should be slightly dug between the rows, burying the last dressing of dung, care being observed not to cut, or otherwise injure the roots. During the second and third summers, the field must also be kept free from weeds by occasional hoeings.

At the end of three years after planting, the roots will be fit to take up. The proper season for this is from November till February; for they should neither be taken up before the stalks are fully decayed, nor deferred till late in the spring; otherwise they would be apt to shrivel and diminish in weight. Begin by digging at one end of the rows, and continue on to the other, in order to take up all the roots. When they are collected, the large roots are to be separated from the small side-shoots, which must be trimmed off and divided into proper lengths, and, with the crown-buds, preserved for fresh sets. The former may be stored in dry sand, in a cellar—first a layer of sets, and then a layer of sand. The crown-buds will keep if laid in a heap and covered with dry sand.

The sooner liquorice is sold, the heavier it weighs; and the greener it is, the more virtue it contains. It is sold in three distinct forms, namely, in the roots, in powder, and in its inspissated juice. The first of these needs no explanation. The second is prepared by cutting the small roots into small pieces, drying them in an oven or kiln, and grinding them in a mill. The third kind is prepared by pounding the smaller roots and fragments with cold water, for nearly two days, after which the pulp is to be squeezed, and the juice boiled down, in an iron pot, to a pitchy consistence, and then rolled or stamped into sticks or cakes, which are sometimes sold under the name of 'Spanish Liquorice.'

An acre of ground has sometimes produced from 4000 to 5000 pounds of liquorice, valued at $400 to $500.

The common liquorice is a native of the south of Europe, but is principally cultivated as an article of commerce in France, Spain, Italy, Sicily, and other islands in the Mediterranean. It was formerly grown to a considerable extent at Pontefract, Yorkshire, in England, Worksop in Nottinghamshire, and Godalmin in Surrey; but a greater part of what is now used in England, is grown at Mitcham, Battersea, Fulham, and other places near London.

Liquorice-roots will keep a year, if laid in sand and stored in a cool dry cellar; and if the sets, or runners and buds, are cut ready for planting, tied in bundles, and set by land-carriage, they will keep a fortnight. If packed in sand, and sent by water, they will keep sound three or four months, especially the more hardy buds.—*U. S. Ag. Jr.*

The *Glycirrhiza lepidota* and *Hedysarum Mackenzii*, are found in the western part of our own continent, and both contain the principle. Liquorice may be worth cultivating here.

J. A. W.

Parsneps.

Arthur Young was quite right when he said, "Of all the roots which we can cultivate, the Parsnep is the most valuable." We are the unwavering friend of the Potato, but we quite agree with another practical man, who says, "Six-pennyworth of Parsnep seed, well sowed, will produce more meals than four sacks of Potatos; and it will not require more than one-eighth part of the ground which the four sacks will require for their growth."

We saw so heavy a crop of Parsneps taken up this autumn—more than twenty tons per acre—and we found some of the produce so excellent, that we resolved to inquire of our friends, among which we number our books; and we now place the result before our readers, as we are anxious that all of them should grow a large breadth next year, and try their value in all the modes and for all the uses we are about to recapitulate.

They are produced finer and sweeter in a temperate climate, such as that of England, than they are in warmer regions; and we find, for they are no food of modern acquirement, that the Emperor Tiberius was aware of this, for he was solicitous of having his Parsneps annually from Gelb, a German town on the banks of the Rhine (*Pliny* xix. 5). They were boiled, the stringy centers removed, and the outer or more pulpy portion served up with wine-sauce, sweetened with honey.

Modern housewives have found out many modes of preparing this root for table, and it has even been converted into bread. "There is a good and pleasant food, or bread, made of the roots of Parsneps, as my friend, Mr. Plat, hath set forth in his book of experiments, which I have made no trial of," quoth old Gerarde; but then adds this sturdy old stickler for wheaten manchets, "nor mean to do!" Whether our readers will be equally prejudiced, we must leave to their own discretion; but we can assure them that in many parts of America the pulp of Parsneps is mixed with Maize flour in the making of bread.

Every one knows the usual mode of boiling and serving up this root, but it is not so well known that it is improved by being mashed like the Turnep, and that cold boiled Parsneps are excellent when sliced and fried.

Every thousand pounds weight of Parsneps contain from 90 to 100 pounds of sugar; and it is this which renders them not only such excellent food for all our farming animals, but also such an excellent ingredient for making home-made wine. Those who have tasted good specimens of this liquor, will agree with us in thinking it the best-flavored of all the British wines. That which we tasted was made according to the following recipe:

Three pounds of Parsneps, scraped clean, and cut in thin slices, boiled in one gallon of water until quite tender; strain the liquor from them, and then rub them through a sieve. Mix the pulp with the liquor, and to every gallon add three pounds of moist sugar. Boil for three-quarters-of-an-hour, and, when nearly cold, hasten fermentation by putting in a yeasted toast. Let it remain for ten days; take off the yeast, put the liquor into the cask, and as it works over, continue filling it up with sugar and water. When done fermenting, bung down the cask, and keep it for a year before bottling. The Parsneps should be used fresh from the ground, and the water should boil before the slices are put into it.

We have also seen directions for making Parsnep marmalade, and Parsnep beer, but we cannot at present refer to this household lore; but we can attest that pieces of Parsnep, boiled until tender, and then put into ginger sirup, have been accepted as very superior "preserved ginger."

In making *bread* with Parsneps, we are informed that the proportion should be one pound of grated Parsneps to two pounds of flour. *Dumplings* may be made by adding one pound of flour to two pounds of grated Parsneps; and a flavor may be given with anything, such as cinnamon or lemon-peel.

The relative fattening and nutritious powers of Parsneps and Potatos are shown by the following table; and we may add, that in practice, Parsneps are found to be much superior to the other root for feeding stock. In every 100 parts of each are found the following constituents:

	Parsneps.		Potatos.	
Water	79.4°	..	75.5	
Starch and fiber	6.9	..	19.0	
Gum	6.1	..	6.8	Fattening.
Sugar	5.5	..	3.3	Fattening.
Albumen	2.1	..	1.4	Flesh-producing.

Lastly, but most importantly, arises the query—What is the best mode of culture? The usual routine is found in our works on practical gardening and farming, but, knowing how largely they cultivate the Parsnep, and how excellently they succeed in its culture in the Channel Islands, we wrote for information to our valued correspondent, Mr. C. Saunders, of the Cæsarean Nursery, Jersey; and this is his reply:

This useful vegetable is much cultivated in the Channel Islands, both for culinary purposes and for feeding cattle; and its truly nourishing and fattening qualities, from the quantity of saccharine matter the root contains, cannot be too strongly recommended to the attention of all cultivators of farming

allotment, or garden ground, as there is no vegetable with which I am acquainted which can be turned to better account, or made to remunerate the farmer or cottage gardener better for his labor.

The variety generally grown, and most approved of in the Islands, is the Guernsey Parsnep. It is a broad, hollow-crowned sort, the root measuring from 1½ to 4 inches in diameter across the top, and tapering rapidly away to the end, which is as small as whipcord, and often 18 to 24 inches long, or from the crown to the extreme end 2½ to 3 feet long. The crops vary from 3½ to 5 cwt. per perch of twenty-two feet square, or 15 to 20 tons per acre, depending upon seasons. This season the crop has been under the usual average, as I find by the returns made by the exhibitors at the Agricultural Society's Show, 350 pounds per perch is the average produce.

Different modes of cultivation are resorted to by different individuals — some preferring to sow them on the broadcast principle, while others — and I think judiciously — preferring to drill them, which is preferable, as, when carefully followed out, it presents so many conveniences in the after-management of the crop, as regards hoeing, and keeping the crop clean, and also in equalizing the space to each individual plant for the perfect development of the leaves, and consequent swelling of the root, and increase of produce.

Without rambling about as to the different means which the inventive genius of man has directed him to apply to the successful cultivation of this useful esculent, I have seen the best results produced in the following manner, viz., selecting a piece of land where the soil is deep — if light and sandy it is none the worse for it — and carting six tons of well-rotted manure on it, per *vergee*, or four-ninths of an acre — that is, forty perches of the measurement before specified — and plowing or trenching the land two feet deep in the month of February, allowing it to remain as rough as possible, that the sun, air, and frost may act upon it, so as to render it sweet and friable previously to sowing the seed in March, or the commencement of April. (This is more particularly necessary on stiff land than where it is lighter, or more sandy and open.) The longer the land lays exposed in this manner the better; but in these islands, where a large proportionate quantity of cattle is kept, and the rearing of cows and heifers constitutes one of the most profitable items in the farmer's returns, it is absolutely necessary to let the grass grow as long as possible, so as to feed them, should the ground broken for the purpose have laid to grass, which is generally the case.

In the month of March the ground is leveled down, either with the spade or heavy harrow, and the seed sown in drills at fifteen inches apart. I once enjoyed the advantage of seeing a piece of land which an experimental friend had divided in two equal parts, one-half of which he had sown in rows at twenty inches apart, and the other half at ten inches. In the latter half the produce was one quarter greater than where the rows were at double the width, the individual plants, in both cases, being from seven to eight inches apart in the rows; and I have since adopted, and recommend, the fifteen-inch distance, hoeing the plants at the same distance in the rows, which has proved more advantageous than either, producing heavier crops, and the plants being sufficiently near to each other to cover the whole surface of the ground, preventing the weeds from growing, and saving a portion of the labor in after-hoeing to keep the crop clean, beside allowing sufficient standing room for digging the roots out (which is generally done in November and December, as they are required), without damaging the crowns, which causes them to rot, if they are kept any time after digging, should it be found inconvenient to let them remain in the ground. Should such be the case, I recommend them to be stacked in round heaps in the open air, covering with a little straw to keep off the wet, as the influence of air and frost tends to render the roots sweeter and more palatable to the cattle.

In feeding, they are generally given in proportions of one-third with other roots and hay, to milch cows, by night, which are turned out to grass by day, and do not, in such quantity, influence the flavor of the milk and butter in the least, while they fatten the animals, and tend much to improve their appearance. To heifers and calves they are given in much larger proportions; and they are also given, with great advantage, where economy is studied, in the feeding of horses which are not required for fast work, and where it is thought desirable to keep them fat and well-looking. I think they are very healthy food for all animals, and their fattening qualities are remarkable. I have known swine to fatten more rapidly on raw parsneps than on barley-meal and boiled potatos, and the flesh, when the animals were killed and cut up, most healthy and fine; and there are some old horses (from twenty to thirty years old), which daily pass our gates, sometimes in carriages, and sometimes in heavier vehicles, well loaded, which have for many years been fed on these roots and hay during winter, and grass and hay during summer, which look remarkably well and healthy, determining in my mind the fact, that where extraordinary exertion is not required from

horses, the Parsnep is a most wholesome and healthy vegetable to feed them with, far preferable to white Belgian Carrots, inasmuch as they are sweeter, more nutritive, more easily digested, and, consequently, producing less perspiration and consequent exhaustion. I would not wish to mislead the readers of your valuable periodical, by allowing them to suppose that they are preferable to all other food, under all circumstances; but I do argue that there are circumstances where much of the expense of keeping a horse may be saved, and the animal kept in equally healthy and good condition by feeding it on this vegetable, cut in slices, and mixed with bran, with hay, instead of the more usual and expensive food, Oats or Beans.—*Cot. Gard.*

Popular Fallacies.

A correspondent of the Journal of Agriculture, touches off some of the Horticultural follies of the day so adroitly, that they are repeated, for the amusement and instruction of the reader.—*Eds. Bot. Mag.*

It has often astonished me, to find that any scheme, or receipt, once allowed to appear in print, generally makes the round of all the public papers, without any further inquiry as to either its probability or practicability, and is acted upon by thousands, who know no better, but merely "take the papers." A few examples I will mention:

When on a recent visit to a friend, who resides on Long Island, I went into his orchard, and to my astonishment saw that all his plum trees were swathed and bandaged around the stems with cotton batting—looking for all the world like so many old dowagers, suffering with sore throats, or stiff necks. Upon inquiry, I found my friend "took the papers," and, likewise, took every thing that appeared therein, as "the truth, the whole truth, and nothing but the truth." He had read an invaluable receipt for preventing the ravages of the curculio, and the aforesaid cotton bandage "was to prevent any and every curculio in the neighborhood, from ascending the trunk of the plum tree, when they should emerge, in the spring from the earth, where they had spent a very quiet and comfortable winter, in the chrysalid state!" Now, as the above-mentioned curculio can fly from any level surface, as well as most of the coleopteræ, (beetle tribe,) as I have oftentimes proved to my satisfaction, these bandages reminded me forcibly of the wise men of Gotham, who surrounded a crow in a field, hoping to catch it. Both Gothamites and receipt-maker, forgetting in their theoretic zeal, that crow and insect possess at least one pair of wings, and moreover know how to use them. Much chagrined at the failure of this invaluable recipe to catch curculios, my friend said with warmth, "It does catch insects anyhow, and I can prove it;" so he did, for upon examining the cotton, we found it full of the larvæ of the coccinella, (lady-bird,) an insect which is one of the best friends the gardener or fruit-grower possesses, as its whole life, both larvæ and perfect state, is devoted to devouring the aphis, (plant-louse,) which is so destructive in our orchards and gardens. Thus the benefactor was prevented from ascending the tree, to exterminate noxious insects, the larvæ possessing no wings, and at the same time nothing was done to prevent the curculio from flying into the head of the tree, where the fruit was forming. Although I reasoned with him, he still persisted in keeping up the hospital appearance of his orchard, for, as he told me, with an incredulous smile, "he had read it in the papers."

Another asserted that the papers said, "to prevent the ants from ascending trees, put on tar or pitch;" and, therefore, his trees were all girdled with an extremely ornamental ring of sticky material, which had the peculiar property of damaging all white pantaloons, or ants, that went too near their trunks. Now, as the ant only feeds upon excrementitious matter, ejected from the aphis, which is elaborated in the stomach of the insect, from the sap of the tree, and which, under the name of honey-dew, so disfigures our vegetation, I don't see what very great injury the poor ant does in making a comfortable breakfast, on what is entirely useless to us, and only disfigures the orchard.

The papers again state, that by putting a saucer-full of chloroform under bee-hives, the bees only sink into a state of sweet oblivion, as to all sublunary affairs, and that the honey may then be extracted from the hive, much in the same manner as teeth are extracted, by a fashionable dentist, under the same influence. Bees and patients knowing nothing about their loss until upon awakening, an awful gap in both hive and mouth, assures the sufferers that all is over, and they none the wiser as to how it happened. Now, the theory is good, and it might do very well, if we knew how to administer the opiate in merely sufficient quantities to produce happy oblivion; but as bees are apt to be very soon intoxicated, if an over-dose is given, instead of being put to sleep for the operation only, they would very likely be put to sleep forever; and until we know *exactly* how much to administer, and *how long* it is to be administered, if we love our bees better than honey, we had better let chloroform alone. By the way, chloroform is very useful for killing insects for the study of natural history, or for cabinets. My plan is to take a small wooden pill-box, drop a few

drops of chloroform on the bottom, where it is quickly absorbed, put in the victim, place the lid on tight, and in a few minutes, the beetle, caterpillar, or whatever it is, is sure to die happy; and what is of more consequence to the naturalist, in good shape, and does not suffer the tortures recommended by some old works on the preservation, etc., of entomological specimens; "such as sticking a pin through the thorax of the insect, putting a piece of card on, likewise, as a safeguard, and then heating the end of the pin in the flame of a lamp, until the poor sufferer expires in agony."

Another grand recipe, has also gone the rounds of the papers, which is to produce either a cherry without stone, or apple without seed—I forget which. We must take the young tree, split it, take out the pith, reunite the dissevered trunk, and lo! our work is accomplished; for, if (?) the tree lives, it will surely produce a fruit without seed. This reminds me of the way that some old works recommend to make bybloem, or two-colored striped tulips; a red and a white tulip root must each be split exactly in two pieces; the half of the red must be fastened and tied to the half of the white, and if a red and a white tulip is not produced, it is not the fault of the operator.

I have also seen, in the papers, the celebrated curculio trap, viz: a wide-necked and wide-mouthed bottle, half filled with molasses and water, and highly recommended by said papers. Good! and so it would be, if curculios were bent upon suicide, and loved *switchel*; but unhappily, for fruit-growers, the curculio is not so desperately bent on self-destruction, and does not love switchel as well as the celebrated Duke of Clarence did Malmsbury wine. I will admit, however, that the bottle of molasses does some good, even if it does not serve the purposes required, of becoming a sepulchre for all molasses-loving curculios; as, on examining the contents of a switchel-bottle, hung up in the orchard of a neighbor, I found about seventy black hornets, that eat the over-ripe plums, and peaches, several wasps, one uncomfortable locust borer, (*Lapeida Bivittata*,) that had, probably, only just popped in, when examining the premises out of mere curiosity; and above eighty moths, but of what species I could not determine, as the color and form of both wings and body, were so disfigured by decay, and molasses, as to be—as the papers say of bodies found floating in the New York docks—perfectly unrecognizable by their nearest friends. However, I thought by certain marks, that some of the victims were the perfect moth of the cut-worm, so destructive to young plants. Many persons, thus seeing the bottle well filled with insects, and not examining the contents, would take it for granted that many of the much-dreaded, and little-known, curculio, were among the number, and would tell of the successful experiment, to their neighbors, who would also go and do likewise. I say, little-known curculio, as many people who talk so learnedly about, have merely a speaking, and not a personal acquaintance with the little depredator; for when a reward was offered for the best plan of destroying it, some wise Jerseyman sent two large bottles full of May-bugs, as specimens of his prowess in the curculio exterminating line. Even in our last week's village paper, I saw an article copied from the Maine Farmer, in which the Crown Imperial, (*Frittillaria*,) is recommended to be grown instead of the potato. Now, this may all do very well for those persons whose delicate olfactory nerves delight in the peculiar fragrance emitted by a certain little black and white animal, (*Mephites Americana*,) very destructive to domestic poultry, and before whom, even the stately shanghai may, with cause, tremble in his feathered hose; but, for my own part, the perfumes of one uncovered and uncooked root of the Crown Imperial, in my study, is enough to drive all study out of my head, for the rest of the day; perhaps, however, the cooking process may render it not only palatable, but even delicious, but I doubt, very much, of its capabilities as a field-crop. I think now, I have pointed out enough popular fallacies, copied into the different journals, without consideration, for the present, although I might proceed, almost *ad infinitum*.—*C. Gard.*

Benefits of Geological Surveys.

Three years ago, the Legislature of North Carolina made a small appropriation for a Geological survey of that State. The discoveries of the first year developed the existence of copper and gold ores, drew to them the attention of capitalists, and have already increased the revenues of the State to five times the cost of the whole survey. In the second year, seams of the purest bituminous coal, some of them fifteen feet in thickness, extending through a region of some forty-five square miles, rewarded their investigations. It is estimated that every thousand acres of these seams will yield thirty millions of tons of bituminous coal of the best quality.

Dr. Fischer de Waldheim, one of the most distinguished Naturalists of Europe, for nearly fifty years professor and director of the Museum at Moscow, died recently in that city, at the advanced age of eighty-two. Early in life he was the companion and friend of Humboldt, and he aided Cuvier in the preparation of his work on Fossils. He founded the Imperial Society of Naturalists at Moscow, and contributed largely to the Russian Annals of Natural History.

Geological Botany.

This topic—by which is meant, not Fossil Botany, but the relation of the soil and its basis and structure, with existing species of plants—is suggestive of many interesting inquiries, well worthy of more systematic consideration, than they appear to have hitherto received. The geological quality and construction of the soil on which certain plants are found, is important, as tending to develop many facts of great practical value to the cultivator and to explain the geographical distribution of plants. Certain species are native to certain conditions of soil, and will grow in no other; and the soil and flora of different localities, are mutually and constantly indicative of each other. This fact has not yet been fully illustrated, but I apprehend it will be confirmed by attentive investigation. The subject has been too carelessly dismissed by botanical collectors. Their notes on this point, are not adequate to the importance of the facts involved. We read simply, that one plant is found "on rocks"—but whether it be on sand-rock, or slate-rock, or granite, or lime-rock, is not noted. And yet, it is of great interest to know, whether the plants observed are common to all rocks, or peculiar to certain descriptions. It may be presumed that the plants of the limestone will not grow upon the granite; but is the assumption confirmed by experience? If true of some plants, is it true of all?

We read, again, that another plant is found in "sandy places;" but, what is the nature of the sand, we are not informed; and whether the plant discovered in dry quartz sand, may be also looked for in the moist, diluvial, mixed sands of our river banks, is left to conjecture. Another class of plants are gathered, the collector records, "in shady woods." But one shady wood will differ essentially from another shady wood; and we have no means of determining whether it be a pine-wood, or an oak-wood, a beech-wood, or a birch-wood; a high and dry wood, or one that is low and damp; and yet, these qualities will permanently affect the minor vegetation of the several descriptions. It may, indeed, be generally apprehended, that the same plants will not be found in either, indifferently. But what are the facts in any selected case? And equally pertinent to the general question, what are the exceptions? What plants are peculiar to one condition of wood and soil and position, and what are common to many or all such conditions? There is much yet to learn on this question—much that cannot be found in the books. There are many similar descriptions, or indications of localities, equally brief and inadequate, to be found in almost any work embracing geographical botany; such as "barren places," "hill-sides," "rocky slopes," shady places," "dry soils," etc. etc. It will be readily comprehended, that these do not meet the wants of science. A dry soil, may be calcareous, sandy, loamy, pebbly, deep, shallow,—which is it? These characteristics of the soil, will be found to have as close a relation to a particular race of plants, as its dryness or moisture. And, I think, collectors of botanical specimens should have a care, to signify with precision, and definiteness, the nature of the soil, upon which the plants they gather, are discovered. And not only of the superficial soil, but, also, of the rocky basis, upon which it rests.

Connected with these observations, and one equally important, is that of the *associations* of plants. Plants seem to have certain compatibilities, independent of their family relations. That is, members of different natural families, by some evident sympathy of tastes and habits, associate together; or occupy the same, or similarly-marked, localities. Such plants often indicate each other. How far this is the case, and how far the general fact is affected by exceptions, we have not sufficient data to determine. The whole subject needs illustration, by more extended and systematic observations. I am aware that many regard the soil, and associ-

ated flora of any given plant, as entirely accidental and indifferent. "That plants," says an English writer, "are generally not conspicuous for their attachment to particular soils, is manifest from the number which will thrive in the uniform circumstances of a botanic garden; where species which have been assembled from a variety of situations, are placed side by side, and grow so well, that there is every inducement to believe the nature of the soil is, with them, of trifling importance."

But this instance does not precisely meet the question. Most plants, when their vitality is not reduced or injured by removal, or any other cause, are very tenacious of life. They will grow in most any medium of heat and moisture. Water and air contain, in variable, but often adequate, quantities, the organic and elementary food of plants; and any soil that will hold water, especially when charged with vegetable mold, will serve to keep most plants alive, and enable them to grow very near maturity. But will they reach that period in well developed vigor? Will they perfect their organs, and re-produce their kind, when removed from a soil and position entirely different, or in any essential particular, different from that to which they are native? The writer I have quoted, admits, in the same essay, that "some plants undoubtedly have predilections for particular soils," but he thinks, the instances "are exceptions to the mass of vegetation." I have too high an estimate of nature's regard to system and consistency, to think so. I think there is design and meaning in all her proceedings; and when she plants, uniformly, one species on quartz sand, another one on limestone rock, and another on clay; one on the dry hill-top, and another in the damp ravine,—I think we shall find, if we pursue it, that her method has wisdom in it; and that it may not be successfully violated, or disregarded. We do not yet fully understand this matter.

The question is, not how far nature's order may be violated with safety; how great a departure from its normal conditions, a plant will endure, and live; but, what is nature's arrangement? What are the natural expectations of the plant? What provision does it find prepared for it, when it springs in its native bed, from the careful hand of its Creator? In the vegetation of the globe, there is unmistakable evidence of distribution, and adaptation. It is contrary to all analogy, to suppose the existing location of species, the result of a broadcast, indiscriminate dispersion. The more the works of nature are studied and understood, the more clearly does it appear, that she does nothing in vain—takes no false steps. Varieties may be accidental, or artificial; species are permanent, and must have a uniform relation to some particularity, some constant characteristic in the locality in which they are originally found. Let us try and discover the law by which this relation is controlled, by a more careful attention to the nature, and composition, and particularly, the geological basis, of the different soils, to which our native plants are indigenous.

J. W. W.

Notæ Botanicæ.

I shall publish from time to time, for the purpose of bringing them to the attention of Botanists, such occasional notes from my herbarium, as seem to illustrate the specific characters of our native Flora. Similar notes from the memoranda of our botanical correspondents, would contribute to the usefulness of our Magazine, and are generally solicited. The selection is given without any attempt at order.

1. *Agrimonia parviflora, Ait.* The specimen differs from most others, and from the descriptions, in having the bracts constantly longer than the pedicels. They are about as long as the petals of the flowers. *Hab. Ohio.*

2. *Crotalaria sagittalis, L.* The specimen is destitute of stipules. As the plant has usually these appendages quite large, the instance is anomalous. *Hab. Ohio.*

3. *Heuchera villosa, Mich.* The leaves are villous, upon both surfaces. Hairs on upper surface, decided and appressed. All our described species have the upper surface of leaves glabrous, except *H. hispida, Pursh.* which in compensation, has the under sur-

face smooth. The specimen is singular. *Hab. Ohio.*

4. *Mentha viridis, L.* Leaves on long petioles. Calyx with numerous oleaginous dots. Leaves and calyx, indeed the whole plant, entirely smooth. These characteristics are peculiar. *Hab. Ohio.*

5. *Polygonum hydropiperoides, Mich.* Specimen corresponds, excepting that the calyces are white, and the sheaths are destitute of bristles and not fringed. The leaves are smooth and plant erect. *Hab. Ohio. Var?*

6. *Stachys aspera, Mich.* Evidently this; but the calyx is not bristly, and is without spinous tips; and the ribs of the leaves are also free from bristles. If this remains in the species, the characteristics as usually given must be reduced. *Hab. Ohio.*

7. *Euphorbia maculata, L.* A variety? with *very small* oval and *entire* leaves. Plant low and prostrate. I think Riddell called this *E. mac. var. parvula.* The variation is well marked. *Hab. Ohio.*

8. *Silene paradoxica? L.* If not this, I know not where to place it; notwithstanding its bright rose-colored flowers. Stem simple, slightly pubescent; leaves broadly obovate, abruptly acuminate, scarcely ciliate on the margins; rough with corticular dots, not pubescent, nodular, opposite and sessile; inflorescence paniculate; flowers pedunculate; peduncles viscous; calyx elongated, not inflated, pubescent; petals oblong, notched. Flowers conspicuous, their color a light purplish rose. *Hab. Ohio.*

Vitis—The American Species.

THE interesting letter in another department from Aiken, S. C. gives a word or two touching the uncertainty that exists, in the determination of our native species and varieties of the grape. The specific characters are certainly not well defined; else, whence the difficulty of recognizing readily, the different kinds, as they are discovered in various localities of the United States? At all events this is certain, that the *fruit* as found on different vines, presents such marked characteristics; the berries are so dissimilar, *inter se*, that it is difficult to keep clear of the error of regarding each peculiar description of fruit, as the produce of an original species of the vine. If we reflect, however, we shall find, in the well known analogies of the peach and the apple, abundant caution against too hasty conclusions in favor of a multiplicity of species. The varieties of grape, catalogued by some growers to the number of two hundred, are not more distinctly characterized by color, size, shape, flavor, etc., than are the many varieties of the peach; and yet the unity of the species, *P. vulgaris*, is doubted by none; and this, notwithstanding differences, more constant and decided than the color and taste of the berry, or the divisions of the leaf of the vine.

There is every indication that the grape, when grown from the seed, is a great sporter; the seeds of a species do not always produce their kind — quite the contrary — this has been especially observed with regard to the cultivated vineyard varieties, and hence the necessity of establishing the species upon constant and uniform characters. Overlooking this principle, Rafinesque, misled by unimportant differences, claimed to have ascertained, as he certainly named, forty odd native species; distributed among over 100 varieties. Michaux, with more care and a nicer comprehension of the true value of apparent differences, had limited already the number of species to five, and in that view he has been sustained by the best Botanists of the country. The largest number now admitted by any good authority, is six; and these will probably be finally reduced to three. European Botanists refer all their numerous varieties to one species, and for myself I am prepared to see our half-dozen assumed species subside at once into two; one with glabrous leaves, (*foliis utrinque glabris;*) and the other with tomentose, (*foliis utrinque lucidis*). It may be, nevertheless, that the marked variations in the outlines of the leaves, in addition to their superficial characteristics, may justify the erection of species upon their differences, when these are ascertained to be permanent. In this direction, however, I am inclined to move with caution; apprehending that the divisions and dentations of the leaves are variable and inconstant characters, referable to position, age,

and vigor of growth. That this is the case in some instances I have already reliable evidence.

Still it must, I think, be admitted, that aside from the characters afforded by the leaves, there are no specific distinctions in any of our native grapes yet discovered; unless, indeed, some variations may be detected, in the polygamous character of the American species—a discovery quite possible.

I agree with our correspondent, that the whole subject needs revision, and more extended and systematic observations are necessary to a right determination of the difficulty. As I am preparing for publication in our Magazine, a monograph of the genus, in all its American varieties, I shall hope to receive the ensuing summer, from all who have opportunities for observation, an abstract of any notes and facts, that may promise aid in the proposed investigation; and I shall be particularly thankful for pressed specimens of leaves, accompanied with brief statements of their age, and the common name, locality, appearance, and characters of the fruit, where known, of the individuals from which they are severally taken. Drawings of leaves and fruit, with similar definitions, will also be acceptable, in cases where it may be inconvenient to send the natural specimens. J. W. W.

A Few Botanical Names, for the Memory.

I HAVE thought it would be convenient, and acceptable to many of our rural readers, to arrange for ready reference, the Botanical names, and family relations, of some of the most useful and familiar productions of the Farm and Garden. I have, therefore, selected the following list of common names, and have added to them their generic and specific names, as they are known in Botany, together with the names of the Natural Families to which they respectively belong. The definitions refer to the generic names:

APPLE—PYRUS MALUS; (*Pyrus*, Latin name of the pear.) NAT. FAMILY, ROSACEÆ, or Rose family.

The varieties are unnecessarily multiplied. Nearly two thousand names are in the catalogues, but a selection of say a dozen has been judged sufficient for any practicable orchard.

APRICOT—ARMENIACA VULGARIS; (Native of Armenia.) NAT. FAM. ROSACEÆ.

Of this, also, cultivators have produced several varieties.

ASPARAGUS—ASPARAGUS OFFICINALIS; (*Asparagos*, a young shoot.) NAT. FAM. LILIACEÆ, or Lily family.

BARLEY—HORDEUM VULGARE; (the Latin name.) NAT. FAM. GRAMINEÆ, or Grass family.

This is the four-rowed species; in another species (H. distichum,) the spikes have but two rows of grains. Both are common.

BEAN—*Windsor;* FABA VULGARIS; (the Latin name.)

BEAN—*Kidney;* PHASEOLUS VULGARIS; (the Latin for boat.)

BEAN—*Lima;* PHASEOLUS LUNATUS; (lunate.) NAT. FAM. LEGUMINOSÆ, or Legume bearing family. (Reduced by Lindley to Fabaceæ.)

BEET—*Common Red;* BETA VULGARIS; (from the Celtic, red.) NAT. FAM. CHENOPODIACEÆ, or Goose-foot family.

There are many favorite varieties. The Sugar-Beet is only a variety, with a pale, yellow root.

BLACKBERRY—RUBUS VILLOSUS; (*Ruber*, red.) R. CANADENSIS—Dewberry. NAT. FAM. ROSACEÆ, or Rose family.

There are several other species and varieties.

BONESET—EUPATORIUM PERFOLIATUM; (*Eupator*, proper name.) NAT. FAM. COMPOSITÆ, or Compound flower family.

BROOM-CORN—ANDROPOGON SACCHARATUS; (the human beard.) NAT. FAM. GRAMINEÆ, or Grass family.

Called in the older books Sorghum.

BUTTONWOOD—PLATANUS OCCIDENTALUS; (*Ptatys*, broad.) NAT. FAM. PLATANACEÆ, or Plane-tree family.

In this country, this is commonly, but very erroneously, called Sycamore; probably from its resemblance to the true Sycamore, which is, however, quite a different tree, namely, *Acer pseudo-platanus*, a species of the Maple, not native to this country.

BUCKWHEAT—FAGOPYRUM ESCULENTUM; (like the Beech-nut.) NAT. FAM. POLYGONACEÆ, or Polygonum family.

CABBAGE—*Common;* BRASSICA OLERACEA; (from the Celtic.)

CABBAGE—*Savoy;* BRASSICA BULLATA.
" *York;* ——— CAPITATA.
" *Cauliflower;* —— BOTRYTIS.
" *Broccoli;* ——— ASPARAGOIDES.
NAT. FAM. CRUCIFERÆ, or Family of cruciform flowers.

CATNEP—NEPETA CATARIA; (an Italian town.) NAT. FAM. LABIATÆ, or Labiate-flowered family.

The proper name is Cat-mint.

CANTALOUPE—CUCUMIS MELO; (from *cuos*, a vessel.) NAT. FAM. CUCURBITACEÆ, or Squash family.

There are several favorite varieties in cultivation.

CUCUMBER—CUCUMIS SATIVUS;
——— ANGURIA; Prickly cucumber. NAT. FAM. same as the last.

CARROT—DAUCUS CAROTA; (the Greek name.) NAT. FAM. UMBELLIFERÆ, or Umbel-bearing family.

CELERY—APIUM GRAVEOLENS; (from its growing near water.) NAT. FAM. same as the last.

CHERRY—*Wild;* CERASUS SEROTINA, (from its native place.)

CHERRY—*Cultivated;* —— AVIUM; many varieties.

CHERRY—*Morello;* —— VULGARIS. NAT. FAM. ROSACEÆ, or Rose family.

CRAB-APPLE—PYRUS CORONARIA. NAT. FAM. same as the last.

CRANBERRY—VACCINIUM OXYCOCCUS. NAT. FAM. ERICACEÆ, or Heath family.

A valuable native, which is by many successfully cultivated; by some authors called *Oxycoccus Macrocarpus*.

CLOVER—*Common Red;* TRIFOLIUM PRATENSE; (three-leaved.)

CLOVER—*White;* TRIFOLIUM REPENS.
" *Welsh;* ——— ARVENSE.
NAT. FAM. LEGUMINOSÆ, or Legume bearing plants.

CORN—ZEA MAYS; (from its supporting life.) NAT. FAM. GRAMINEÆ, or Grass family.

There are several native and cultivated varieties, well distinguished, though the specific characters are very constant.

CURRANT—*Red;* RIBES RUBRUM; (Arabic name.)

CURRANT—*Black;* RIBES NIGRUM. NAT. FAM. GROSSULACEÆ—Gooseberry family.

CYMLING—CUCURBITO MELOPEPO; (from the Celtic, for gourd.) NAT. FAM. CUCURBITACEÆ—Squash family.

CHESTNUT—CASTANEA VESCA; (name of a place.) NAT. FAM. CORYLACEÆ, (formerly *Cupuliferæ*.)

ELM—*Common White;* ULMUS AMERICANA; (Latin name.)

ELM—*Slippery, Red;* ULMUS FULVA.
NAT. FAM. ULMACEÆ—Elm family.

ELDER—SAMBUCUS CANADENSIS; (musical instrument.) NAT. FAM. CAPRIFOLIACEÆ, or *Caprifoils*.

So called from the habit goats have of browsing on certain species.

EGG-PLANT—SOLANUM ESCULENTUM; (etymology obscure.) NAT. FAM. SOLANACEÆ.

This is the favorite purple-fruited; the white-fruited is thought to be another species.

ENDIVE—CICHORIUM ENDIVIA; (etymology obscure.) NAT. FAM. COMPOSITÆ, or family of Compound flowers.

This is also called *C. sativa*, the name of the common variety. It is the Succory of some gardeners; not the wild Succory, the root of which is sometimes substituted for coffee.

FLAX—LINUM USITATISSIMUM; (from the Greek.) NAT. FAM. LINACEÆ, or Flax family.

Well known by the oil produced from its seed, and the linen thread from its fiber.

FILBERT—CORYLUS AMERICANA; (from *Corys*, a helmet.) NAT. FAM. CORYLACEÆ, or family with corys-shaped fruit.

In some books this order is called *Cupuliferæ*. Lindley has made the change, and Botanists will probably follow his lead. This plant is our common wild Hazelnut.

GARLIC—ALLIUM VINEALE; (from the Celtic.) NAT. FAM. LILIACEÆ, or Lily family.

The Leek and Onion are allied species of the same genus. It is not regarded as a native, though widely diffused over our country.

GINSENG—PANAX QUINQUEFOLIUM; (*Pan*, all, *akos*, a remedy,) NAT. FAM. ARALIACEÆ, or Aralia family.

The root has an economical value as an article of export.

GOOSEBERRY—RIBES SATIVUM. NAT. FAM. GROSSULACEÆ, (see Currant.)

A variety of the Linnæan species *R.*

uva-crispa. There are many valuable English varieties, in cultivation.

GRAPES — *Small Wild;* VITIS ÆSTIVALIS; (from the Latin.)

GRAPES—*Frost or River;* VITIS RIPARIA.
" *Fox;* —— LABRUSCA.
" *Muscadine;* —— VULPINA.
NAT. FAM. VITACEÆ, or Vine family.

The American species are not well understood. There are probably about three well-marked native species, but their characters are not accurately described. It is my design to publish a monograph of the genus, and I am desirous to obtain specimens and descriptions, as will be seen elsewhere. The *Labrusca* is probably the parent of the many varieties with which our vineyards are stocked.

HEMP—CANNABIS SATIVA; (from the Greek.) NAT. FAM. URTICACEÆ—Nettle family.

HEMLOCK — *Poison* — CONIUM MACULATUM. NAT. FAM. UMBELLIFERÆ — Family of Umbel-bearing plants.

This dangerous weed is known by its pinnatifid dissected leaves, and spotted stem, which, when bruised, emits an unpleasant odor.

HEMLOCK — *Spruce;* PINUS CANADENSIS. NAT. FAM. CONIFERÆ, or Cone bearing family.

By some authors called *Abies Canad.* One of our most common and valuable Firs; a sub-genus to the pine.

HICKORY — *Shell-bark;* CARYA ALBA; (the Greek name.)

HICKORY—*Pig-nut;* CARYA PORCINA.
" *Bitter-nut;* —— AMARA.
" *Pecan;* —— OLIVÆ-FORMIS.
" *White-heart;*—— TOMENTOSA.
NAT. FAM. JUGLANDACEÆ, or Walnut family.

HONEY-LOCUST — GLEDITSCHIA TRIACANTHOS; (in honor of a German Botanist.) NAT. FAM. LEGUMINOSÆ—Legume bearing family.

HOP—HUMULUS LUPULUS; (Humus, mold—in which it grows.) NAT. FAM. URTICACEÆ, or Nettle family.

This is native to most parts of the United States.

HORSE-RADISH — COCHLEARIA ARMORACIA; (*Cochleare*, a spoon.) NAT. FAM. CRUCIFERÆ, or family of cruciform flowers.

HUCKLEBERRY—*Black;* GAYLUSSACIA RESINOSA; (after Gay-Lussac.)

HUCKLEBERRY—*Blue;* VACCINIUM PENNSYLVANICUM.

HUCKLEBERRY—*Swamp;* VACCINIUM CORYMBOSUM. NAT. FAM. ERICACEÆ, or Heath family.

Of the Huckleberry, there are many indigenous species, some of which are peculiar to certain localities. The *V. Pennsylvanicum*, is the common blue-berry of the northern markets. The most esteemed is the *Corymbosum*, the tall shrubby huckleberry of the swamps of the middle states; otherwise known as the Swamp blue-berry, a common associate of the cranberry.

LETTUCE—LACTUCA SATIVA; (from its milky juice.) NAT. FAM. COMPOSITÆ, or Family of compound flowers.

LOCUST—ROBINIA PSEUD-ACACIA; (in honor of J. ROBIN.) NAT. FAM. LEGUMINOSÆ, or Legume bearing family.

MAPLE—*Sugar;* ACER SACCHARINUM; (*Acer*, sharp, a point.)

MAPLE—*Red;* ACER RUBRUM.
" *Silver;* —— DASYCARPUM.
" *Striped;* —— PENNSYLVANICUM;
NAT. FAM. ACERACEÆ, or Maple family.

There are other species, but I have named the most familiar.

MULBERRY—*Red;* MORUS RUBRA; (Greek, *morea.*)

MULBERRY — *Paper;* BROUSSONETIA, PAPYRIFERA, NAT. FAM. URTICACEÆ, or Nettle family.

Reduced by Lindley to *Moraceæ*, or Morus family.

MELON — *Water;* CITRULLUS VULGARIS; (Etymology not clear.)

MELON—*Musk;* CUCUMIS MELO; (see Cantaloupe.) NAT. FAM. CUCURBITACEÆ, or Squash family.

There are many varieties. The Water-Melon is a native of Africa, and some parts of India.

MUSTARD—*Black:* SINAPIS NIGRA; (derivation uncertain.) NAT. FAM. CRUCIFERÆ, or Family of cruciform flowers.

Though so common in waste fields, this plant is not a native. It is introduced from Europe, and merits more extensive cultivation.

NECTARINE—PERSICA LÆVIS; (from Persia, its native place.) NAT. FAM. ROSACEÆ, or Rose family.

This is simply a smooth variety of the common peach. J. W. W.

(TO BE CONTINUED.)

To Botanists.

THE Botanical Department of our Monthly, it is hoped, will be enriched by your contributions. New facts and new thoughts on the Phenomena of Vegetable Life—notes of new and interesting Plants—descriptive-lists of Local Floras—reports of Botanical Societies—memoranda of Exploring Parties—all these subjects are appropriate to our object; and the co-operation of all who have knowledge and appreciation of the attractive Science their discussion is designed to illustrate and advance, is earnestly desired.

I will be specially thankful and remunerative in kind, when it is in my power, for any specimens of native or foreign plants that may be sent me, in either a fresh or a dried state. As to the Descriptive Catalogue I have designed and commenced of the Botany of Ohio, I can only say, in answer to the numerous inquiries in regard to it, that its preparation is a work of time, care, and constant revision and advisement, and that no period can be fixed for its final completion. Line upon line, by a gradual but steady growth—now a little and then a little —it may ultimately grow into the acceptable thing I have hoped to be able, by the kind aid of Ohio Botanists, to make it. A mere description of native species is no difficult matter; but it is something more to complete the purpose I have designed; embracing the topographical, geographical, and especially the geological characteristics, of the different localities, where species are found native to the soil. This work I have begun; my design being to map out the State, as it were, into districts and localities, marked by peculiarities of soil, geology, and relative position; and either distinguished by special and consistent Floral Associations, or remarkable by the presence of certain isolated and peculiar forms. This is, clearly, not the work of a day.

I owe my acknowledgments for lists and specimens to Mr. L. LESQUEREUX, J. W. VANCLEVE, Esq., THOMAS HOLE, Dr. C. A. CANFIELD, Dr. G. W. KELLOGG, Dr. JONES, Mrs. MARY H. SANFORD, Miss JULIA HUGGINS, and others, to whom I shall be again obliged, doubtless, for similar attentions.

J. W. W.

California Plants.

TEA TREE.

WHO that has communed with nature in her gayest attire, while wending his quiet way among the hills of San Francisco, has not observed a small shrub with dark ever-green foliage, beautiful lilac-colored and lilac-clustered flowers, redolent with a delightful fragrance! This unobtrusive little *shrub*, in the *Happy Valley* portion of our city, emulates a *tree* on the North Beach side; reaching to the height of 12 feet; and 21 inches in circumference.

The amateur observer may see a more magnificent specimen than the above, on the road-side as we go toward the coast, in the direction of the Sugar-Loaf Mountain, near the Mountain Lake. This tree is 3 feet in circumference, 20 feet high, having a straight well-proportioned body of at least 6 feet without a branch. These particulars are noted on account of our authors, who speak of the largest shrubs as only attaining to the size of a man's arm.

This is a species of the "New Jersey tea-tree;" that distinguished *name* having been obtained for its kin, the *Ceanothus Americanus*, during our revolutionary war; its leaves being used as a patriotic substitute for the famous Boston, or China tea.

Our California tea-tree is the *Ceanothus Thyrsiflorus*. Called also here, *Wild Lilac.*

The *flowers* are in long conic clusters at the extremity of the young branches; of a bright blue color, even when dry; the little petals of the flower are singularly arched in, forming a sack, shaped like a Turkish turban. The dry *fruit* is obtusely three-angled, with three cells, and three seeds. The *leaves* also, are three-ribbed, with strong veins beneath, dark varnished green above, edges with small glandular or dotted teeth; the young branches are angled or ribbed, and of a deep sap-green color like the leaves.

This native shrub, when carefully cherished and trained, cannot fail to prove highly ornamental. The dense clustered dark shining evergreen foliage, and beautiful fragrant flowers, have already enlisted some attention; as one may see, from the laudable efforts at training and transplanting it in this city. If

the Fringe-tree, Snowdrop-tree or White Ash as it is called (a Chionanthus) were brought here from the old states, and this budded into it, as the lilac has been, the three blooming at the same time of the year would display a grace and harmonious contrast rarely seen.

The shrub, especially the root, is quite astringent, and may be used in spirits, tea or powder; where the use of astringents is proper. The leaves make a yellow dye, and have an economical value for that purpose.

SAMPHIRE.

How has the bountiful hand of Providence spread along our path the delicious herbs, and scattered His beauties in glorious harmony around us! In the plant before us we find the useful relish, that meets us in every clime.

The *Samphire*, (Saltwort or Glasswort) so abundant in the vicinity of San Francisco, is the *Salicornia Ambigua*. For popular purposes we omit the particular botanical description owing to the obscure inflorescence. Both the genus (the *Salicornia*,) and the particular species (the *Ambigua*) are readily distinguished by their general appearance.

It may be known by its leafless stem, nearly cylindric, jointed branches, commonly about the size of a small quill, and about a foot high; the young branches are very tender, succulent, fleshy and brittle. The species named *Ambigua*, is distinguished by its *crescent-shaped joints;* the weak stem generally falls to the ground and is much branched. Some doubts have been entertained as to its proper woody character, but here we often see long cream-colored stems of perennial growth, that are most evidently woody.

It is styled *Saltwort*, because, when chewed it has the taste of salt; hence the Latin origin of its name *Sal*, (salt,) and *cornu* (a horn,) alluding to the horn shape of its branches—hence—*Salicornia*.

By simply pouring vinegar upon these little herbaceous twigs, we obtain one of the most delicious and wholesome pickles known. Our plant, when burned, yields the soda of commerce, beside other marine minerals, which render it salutary and restorative to the invalid.

The true end of all knowledge is use. This little obscure plant will add another to the long list of our native edible herbs.

Our All-Wise Benefactor has blended both the useful and the beautiful in a gladdening and charming harmony, and we love them both.

CERASUS ILICIFOLIUS, OR EVERGREEN HOLLY-LEAF CHERRY.

THIS beautiful ornamental evergreen is found within the limits of San Francisco, on the North Beach side of our city, below Clark's Point, perched upon the brow of one of the loftiest bluffs of the Bay. At this point the trees are young and thrifty, shooting up erect and spreading branches, with a dense, dark glossy green foliage—often bent back, inclosing or hiding their twigs from the casual view; the leaves thus arranged, alternately in four ways loosely imbricated, like tiles on a roof, give the young branches a somewhat stiff, columnar appearance.

At Captain Maltby's rancho, just below Point Jackson, in a sheltered nook of the Bay, it is much larger, rising to thirty feet in height, and about a foot or more in diameter. Here we observed one of those remarkable, fantastic freaks of nature so common on the Pacific; numberless limbs on all parts of the tree were seen growing together, often to upward of twenty, all united, forming singular fan-shaped radiations of flat twigs from one to two inches in width, and no thicker than a quill! Some fine specimens of the Holly-leaf Cherry are to be seen on the road between Monterey and the Solidad Mission; it is also said to be common about the Mission of San Antonio, and along the western slopes of the mountains as far south as San Bernardino.

From the general appearance of the foliage, it naturally suggests to every one, at first sight, the idea of its being a species of *Holly*. This mistake we were well nigh falling into, on seeing it for the first time in mid-winter; but tasting, (as we are wont to do) soon revealed the true cherry flavor. It is from this circumstance named *Cerasus* ILICIFOLIUS

(from *Ilex*, the Holly, and *folius*, a leaf—or conjoined, signifying *Holly-leaf* Cherry.) This species of evergreen cherry bears the corresponding relation to the Sylva of the Pacific, that the evergreen cherry of the south does to the Atlantic: we allude to the *C. Caroliniana*, or "Wild Peach," as it is called in the south-western States, (owing to the strong peach-kernel oder, etc.,)—hence we often hear of the "wild-peach lands," to designate certain rich, light and generous soils. In some sections it is better known as the "Mock Orange," also "Cherry Laurel." Both these species belong to the very natural section of *Laurocerasus*, along with the family of the bitter almonds. This subdivision of the genus *Cerasus*, is distinguished by the racemes of flowers springing from the axils or forks of the old persistent leaves of the growth of the *former* season, as we see exemplified in the species before us. The California evergreen cherry, like its allied species beyond the mountains, is commonly a small tree, very much branched; the leaves are large, on short stems; broad, roundish heart-shaped; spinosely or prickly-toothed, veiny, smooth and shining above, and of a rigid, leathery texture; margin wavy, subfolded and bent back on its stem. The flowers are in dense racemes, (like the black cherry,) about as long as the leaves, though when mature they are two or three times as long.

The fruit is by far the largest of any known indigenous variety; specimens are brought to our market one inch and an eighth in diameter, with about one-eighth of pulp; the form is oval and somewhat pointed, the point is turned to one side; dark purple, or black; the flavor a bitter-sweet, and astringent—not very palatable to most persons. The Indians, however, crush the fruit, to make a kind of bread, of which they appear to be extremely fond; it is called by the natives *Islay*. The stone of this fruit is very large, and in some localities the pulp is meager and rather dry.

We invite the attention of Nurserymen and Gardeners to this tree, as one of great value to them. We need scarcely remark that these seed should have the preference for seedlings, and stocks for budding and grafting the delicious foreign varieties. The fact of their being indigenous, and the consequent certainty of perfect adaptation to our soil and climate, ought sufficiently to recommend them. We have seen many failures in fruit culture, from not properly appreciating the importance of suitable stocks; e. g. in some parts of the Southern States, the large "sawyer" worm cuts into the root and destroys the apple, when if stocks of the wild crab were grafted, no such casualty would happen; we have also seen them destroyed in some soils by the roots shooting down upon clay and stagnant water or moisture; whereas the wild crab thrives *best* in these very localities, shooting its roots *horizontally* near the surface, and to great distances, thereby also resisting the high winds of the rainy season that prostrate the cultivated kinds in some localities.

Our space will not allow the full illustration and enforcement of these views; we trust those interested will heed a hint in the right direction.

We have never heard of the poisoning of cattle by this species, as is sometimes the case with the *C. Caroliniana*, although from its natural alliance and sensible properties, there is ground to apprehend it. Should this meet the eye of any one to whom such a case is known, we hope they will state the fact for the good of the public.

The timber is of a reddish tint, similar to the other species—very tough and rather close-grained, and susceptible of a fine polish; nothing can equal it for wedges, in the small operations of the shop and farm, as they seldom if ever become loose. We have not heard of its use for cabinet or other work.

A spirituous tincture made from the bark, in doses of thirty to sixty drops, we have found, by experiment, to be an excellent remedy in torpor of the digestive powers. In many cases a cold, watery infusion, to the extent of half a tumbler as a dose, is preferable. We entertain no doubt it will prove fully equal to the black or wild cherry bark of the Atlantic States. In this point of view, it is one of the most valuable remedies of California. We have heard of agues being cured by eating four to six of the pits, but of this we cannot speak from experience. In

addition to the useful purposes before mentioned, we cannot forbear to recommend it as one of the many beautiful evergreens, destined erelong, to beautify the now lonely and desert homes of the pioneers, on the shores of this heaven-blessed Pacific.

A. Kellogg, M. D.

San Francisco.

New Plants.

PHILESIA BUXIFOLIA.

Discovered in the Straits of Magelhaens, by Commerson, and detected by Banks and Solander, in Good Success Bay: since found to extend along the west coast of Antarctic America to Chiloe and Valdivia, by various navigators and naturalists, from most of whom we possess specimens. In Valdivia, Mr. Bridges says, it is called "Pepino," and is found at the summit of the Cordillera there, in marshy places, under Alerse trees. Some authors have expressed doubts if the genus *Philesia* be truly distinct from its near ally, *Lapageria*; but, however closely may be the resemblance in the petals, the truly calycine character of the short outer perianth, the erect stem, and very different foliage, (much resembling *Luzuriaga*,) and the monadelphous stamens, will surely keep them distinct. The species proves quite hardy with Mr. Veitch, at Exeter.

Description.—An erect, much-branching, shrubby plant, three to four feet high in its native country. We have flowering specimens before us, varying from four inches to a foot and a-half, much branched; branches, alternate, principal ones, as well as the stem, naked below, cylindrical, and scaly, with brown lanceolate scales at the joint; branchlets, angular, green, here and there scaly. Leaves, alternate, varying on different plants, from an inch to an inch and a-half long, stalked, linear-oblong, leathery, evergreen, feather-nerved, smooth, sharp-pointed, milky green beneath, the margins bent back. Leaf-stalk, articulated at the setting on of the leaf, and the leaf is often deciduous there, leaving the persistent short leaf-stalk. Flower-stalks, exceedingly short, terminal on the branches, bracteated at the base of the flower. Flower, solitary, drooping, large. Calyx, nearly three quarters of an inch long, of three, oblong, rather blunt, imbricating, appressed *sepals*, concave, skin-like. Corolla, two, or two and a quarter inches long, straight-sided-bell-shaped. *Petals*, oblong, reverse-egg-shaped, slightly pointed, bright rose-red, somewhat waxy, equal, concave, when dry, veiny, the base united; each having within a hard, oblong, depressed, gland, or nectary. Stamens, springing from the base of the petals. Filaments, united into a tube, below the middle, then free, erect, equal, a little shorter than the petals. Anthers, erect, rather arrow-shaped. Ovary, small, three-angled, oval, one-celled, with three short parietal *placentæ*, which bear several *ovules*. Style, a little longer than the stamens, rather thick. Stigma, indented, the recurved margin obsoletely three-lobed. Fruit, an oval-subglobose, pointed *berry*, rough on the surface from the many seeds within.

GOLDFUSSIA ISOPHYLLA.

This genus was named in honor of Dr. Goldfuss, Professor of Natural History, at Bonn. It belongs to the Natural Order of *Acanthads*, and to Didynamia Angiosperma, of Linnæus. This species is known in gardens, as the *Ruellia isophylla*. The flowers are pale-blue, with dark zig-zag veins on the tube, at the back of the lobes. It differs nothing from *G. anisophylla*, to the eye of a common observer, except in being more regularly leaved, and less straggling in its growth. It is a small, stove, evergreen shrub, a native of Silhet.

PODOLEPIS CHRYSANTHA.

A half-hardy annual, said to be a native of the south-west coast of New Holland. Its flowers are bright yellow. The genus belongs to the Natural Order of *Composites*, and to the Syngenesia Superflua of the Linnæan system.

BRASSAVOLA LINEATA.

This stove Orchid was sent to this country from South America, by Mr. Warscewitz, in 1852. It bloomed for the first time at the Nursery of Messrs. Jackson and Sons, Kingston, in the June of 1853. It flowers

in pairs, which spring from the root, and hang down. The petals and sepals are a very pale creamy-white; the lip, which is very large, nearly pure white.

LEPTOSIPHON LUTEA.

This genus is very appropriately named, *Leptosiphon*, being, literally, slender-tube, for which the flowers of the species are remarkable. This species is also known as *Gilia lutea*. It was found by Mr. DOUGLAS, in California, but it has not been much in public, before the present year. It is a highly ornamental, hardy annual, about six inches high. The petals are yellow, with a bright orange eye.

PANDANUS PYGMÆUS.

A stove evergreen spreading shrub, about two feet high. It reached Kew, some twenty years ago, from the Botanic Garden at Mauritius, but was stated to be a native of Madagascar. It flowered, for the first time, in 1852–3, producing only female flowers. It belongs to the Natural Order of *Screw-Pines*, and to Diœcia Monandria of Linnæus.—*Cot. Gard.*

Pillar Roses.

WHEN we want a fine specimen of a Portugal Laurel, or Laurustinus, or of a pyramidal fruit-tree, as a Pear or Apple, we must begin, and always continue, to allow the bottom tier of branches to be the longest, and every successive tier above that must be a little shorter than the one below it; as long as this goes on, it matters not if the top is so high that a swallow could not fly over it, it will never get top-heavy, and the top shoots can never starve the bottom ones by over suction. It is not exactly on this very plan that Pillar Roses are brought up in perfection, but the principle is just the same; the strongest part of the Pillar Rose, or of the specimen plant or tree, must always be the bottom part. Roses, in general, and particularly those of them that are naturally best fitted for being made into pillars, have that kind of habit which is easiest to manage and mold into the form of a pillar than into any other form whatever, that is, their habit of throwing up strong suckers from the collar of the plant, so that we should always have more wood at the bottom of the plant than we needed, instead of bare wood, were it not that such Roses are budded and made to grow on other roots than their own, thus depriving them, in a great measure, of their natural propensity of throwing up suckers. According to our present mode, the suckers must come from the Dog Rose collar, and these we must battle against; instead of their coming in so handy as they would do, were they natural suckers to that particular Pillar Rose, we are compelled to witness the nakedness at the bottom become more naked, year after year, and still are obliged to rub off suckers as fast as they rise; surely, then, we are not yet on the best road to easy success with *Blairii*, No. 2, and many more such Roses.

Let us, therefore, turn to a new leaf, and from this season never plant another Rose which is intended for a Pillar, except it be on its own roots, and not budded on any other stock whatever. Ten feet is a good hight for most of the strong Pillar Roses; and when we have the proof of the practice before our eyes, in that several varieties of the *Moss Rose* are higher than ten feet on their own roots, and also that Moss Roses require the very best soil, we need not doubt for one moment that all and every one of the *Hybrid Chinas* and *Hybrid perpetuals*, above the medium-sized kinds, as *Duchess of Sutherland*, will do for Pillar Roses much easier, and in a worse soil than any of the Mosses, if they are on their own roots.

It is more from prejudice, and for the mere convenience of the dealers in Roses, that Roses are budded at all; at any rate, it is not from any good budding can possibly be to the Rose itself, unless, perhaps, to the very weakest; and what is more strange than all, the weakest Roses, and those of most tender constitutions, as some Chinas and Tea Roses, are left to shift on their own roots entirely. If I was young again, and with my present experience, I would make up my mind never again to plant any Rose whatever *except Standard Roses*, except on its own roots. I would then get rid of all the bother and disappointment caused by unsuitable stocks, and want, or supposed want, of Rose soils. All our best Pillar Roses ought certainly to be propagated from cuttings and layers, instead of from buds, but they never will, in a regular way of business, until the public have sufficient time to prove that many roses can hardly be made into decent pillars, after the first few years, and that, under all circumstances, it is far more difficult to manage a worked Rose pillar, than one on its own root.

This settled, let us now suppose a case in which a gentleman has bought or built a new house, the garden, and all the rest of the land being also new to planting, and that he read of the splendid Pillar Roses at Bank Grove; if he has any taste at all for gardening, and if he has not, let us hope that he is not married, he would surely wish to have one Pillar Rose, if only one; but having heard

that *Blairii* No. 2, one of the finest for pillars, is so apt to get bare below, and turn shabby, after the first few years, he would wish for it, but still fears the trouble, and much more the disappointment, and makes up his mind for *Coupe d'Hebe* or *Madame Laffay*, or some such easily managed kind. If he discover that *Blairii* No. 2 can be so managed, that nothing but sheer inattention to the simplest rule can cause any one to fail with it, any other Pillar Rose may be tried. It is more than likely, that any of the large growers can supply plants of this Rose from cuttings, as it comes from cuttings in the spring as easily as a Verbena, that is, if the old plant is forced, and cuttings made of the young shoots; at all events, we must have a good, healthy, young plant of it, on its own roots, to begin the pillar, and good fresh loam, with a spadeful or two of solid rotten dung to plant it in, and then we must prune it on the close system, down to three or four eyes, and water it occasionally through the first summer.

It is at the next pruning, this time next year, that one is apt to make the first mistake with it. I am persuaded that Pillar Roses ought certainly to be pruned for the first six or seven years by the end of October, unless the season is very mild indeed, such as we had this time last year. In that case, the end of November, or any time before the new year, would be early enough for the pruning. We shall take it for granted, that our young Pillar Rose made three shoots the first season, one of them being stronger than the other two put together, and considering that the form is to be that of a pillar, nothing seems more natural than that the strongest shoot should be cut down to one-half its length—say to three feet, as a foundation to the pillar, and that the other two were cut to within a few inches of the bottom, to make sure of a succession of wood, and that plan would do very well with a great number of Roses, but not with *Blairii*, and a few others that are equally strong; so sure as you are alive, if that Rose was cut so at that age, or at any time during the first ten years, so sure the attempt to make a fine balanced pillar of it would fail, the strong shoot would keep the lead, and get stronger and stronger every year, and the young idea might be thinking, all the time, that nothing could be more promising, but by-and-by, the bottom begins to get bare of shoots and leaves, and the tale ends like that of our correspondent.

There is not one amateur in a score who could explain the first mistake of cutting the strongest shoot to three feet only, which was the sole and entire cause of the present failure. An experienced Rose-grower can see it at once. If this Rose gets away in the head while the plant is young, it is not disposed to make suckers in after years, therefore it must be a very great mistake to allow it, while it is young, *to make one shoot stronger than another*; but the first year that could not be helped; at the second pruning, instead of leaving the strongest shoot three feet long, it ought to have been cut down to six inches, and the two weaker ones, instead of being cut into a few buds, ought to have been left at half their length; just the very opposite of what we supposed would be the case, and that which is done in nine cases out of ten. Trees and bushes, however, which are trained for particular purposes, and into particular forms, must be managed and set off at first rather by particular modes of pruning than by any fanciful training; and here is an example—the weaker shoots of this Rose are left longer than the stronger one, in order to get three, four, or five shoots direct from the bottom, and each of them of as near the same strength as possible.

Thus, in one small sentence, we have explained the whole art and mystery of keeping Pillar Roses in health and beauty for an indefinite period; get a certain number of shoots from the very bottom, not less than three, and it is only bad management, or very bad soil, and late spring frosts, that can ever do them much harm afterward. But with the best management, and under favorable circumstances, some of these strong Roses have already failed under the more ordinary practice of the gardener, therefore it is not now necessary to repeat the experiment to prove the fact. Very many of the best Pillar Roses throw up such a quantity of suckers, if they are grown on their own roots, that the difficulty is to know how to dispose of them for the first few years; yet, to such as do not thoroughly understand the rules for pruning different Roses, I would advise the plan of not allowing any Rose intended for a pillar, to grow up with one strong stem in the middle, but always with five shoots, if possible, of the same strength; and after that, whenever a shoot much stronger than the rest appears, instead of encouraging it on, and making use of it as a center, it ought to be stopped before it gets more than a foot or eighteen inches long. I would insist on this rule, particularly after reaching the hight of seven feet. It is just as treacherous to allow *robbers* above that hight in a Pillar Rose, as it would be at the top of a full-spreading Peach.

To sum up in a few words—Use strong, young plants on their own roots for Pillar Roses; prune them the first two years, so as to encourage a few healthy and equally strong shoots from the very bottom; continue at least three shoots of equal length for a center, the other shoots to be cut to different lengths, to keep up a succession of young wood, and form the outline of the

pillar; never allow one shoot to get much stronger than the average strength of the principals or center shoots; never attempt to get up a Pillar Rose with only one shoot for a center, until you have mastered the mysteries of the art of pruning; and never lose sight of the fact, that all the pruning in the world will not save a few Roses from ultimate failure, if they are first brought up with only one strong shoot in the center, and *Blairii* No. 2, is one of them. *Hybrid Chinas*, and all other summer Roses, ought to have the principal pruning for the year when the flowering is over; and all the winter pruning they need, is to thin out shoots where they are too crowded, to cut out very weak ones altogether, and to cut off the points of the rest, so as to keep the symmetry of the pillar. Summer-pruning is the grand secret: winter-pruning the bane of this class. But for *Hybrid Perpetuals*, it is in the winter-pruning alone that we must look for beauty and success in the following season.

And now as to how to deal with the bare Pillar Rose, *Blairii* No. 2. There are only two ways to deal effectually with such an extreme case. I have seen palliatives enough tried, and fail with such instances. It is of no use to beat about the bush in such cases; the first of the two remedies is the most effective, but goes hardest against the grain—it is to cut down the whole pillar to within one foot of the ground, to renew the bed, and to water frequently with strong manure-water for the next half-dozen years, when this very pillar would be ten feet high, and in the highest possible health, providing the roots are good. The second plan is, to bend down the pillar very carefully, as low as possible, next February; to keep it down in that position, tied to stakes, for a season, and perhaps two seasons, until suckers were forced from the bottom, then to cover the naked parts with them, and ultimately, the old rose to be only a mere center-piece to the renewed pillar.—*Cot. Gard.*

D. Beaton.

Chinese Agriculture.

An interesting lecture on this topic was delivered on the evening of the 20th of October, in San Francisco, by Rev. William Speer. Mr. Speer spoke only of the southern part of the Chinese Empire, the part he had visited. The mountains are cold and barren. No extensive forests are seen, but only here and there a shrub. No fences—the only partitions are dykes of earth thrown up, intersected by floodgates to water the rice-fields. These dykes, some of which are well paved, constitute the only means of communication. The produce of the country is carried in boats upon the rivers and canals, or swung on poles on the shoulders of coolies. No wheeled vehicles. The rich travel in sedan chairs carried along the dykes, or in boats. No solitary dwellings dot the country, as in Christian lands, but the people gather in villages for mutual protection from thieves and robbers. Rice, the principal grain, and chief article of food, is sown broadcast, on fields cultivated by a rude plow, drawn by an animal resembling our ox. The fields are flooded, and the young plant is transplanted in rows, harvested by an instrument like our sickle, and thrashed or trampled out at the granary. Our fanning machine has been known in China for centuries. It was carried to Holland, then to Scotland, and then to the United States. Rice is usually boiled, sometimes ground into flour. A liquor is distilled from it, much used at meals.

Wheat is raised in the north of China, and sent below for sale to foreigners. Hemp is cultivated extensively, and made into fabrics. Cotton is raised also to a great extent.

The sugar-cane is widely cultivated, also the sweet potato, ginger root, oranges, lemons, limes, dates, grapes, and a great variety of vegetables and fruits—many of which might be introduced successfully into California.

Tea and silk are the two most important products. Tea is cultivated in almost every part of China, the coarsest in the Southern part, and the best in the region called the Mohie hills. The soil best adapted is on elevated localities, formed of disintegrated granite and sandstone. It is difficult to transplant it. It has been carried to England in glass boxes, hermetically sealed up, so as to allow the light, but no air to enter or escape.

The gardens of the Chinese are laid out with great taste and beauty. In them bloom the choicest flowers, Lotus, Geranium, night blooming Cereus, Camellia, etc. Shaded walks, arbors, artificial lakes, and small temples, hung with tinkling bells, diversify and lend interest to the scene.

Mr. Speer concluded with some remarks upon the benefit which Chinese industry and ingenuity might confer upon this country; and what benefits in turn they would receive from our science, art, and religion.—*Pacific, San Francisco.*

Why this insatiable craving for riches? Does a man drink more because he drinks from a large glass? From whence this universal dread of mediocrity, the fruitful mother of peace and liberty? Ah! here is the evil which above all others, it should be the aim of both public and private education to anticipate. If this was got rid of, what treason would be escaped, what baseness avoided, what a chain of excess and crime broken forever!—*Eds. Bot. Mag.*

Editor's Bureau.

Prognostications of the Weather.

I HAVE observed an occasional paragraph in the newspapers, indicating a renewed attention, in certain quarters, to the old subject of foretelling, by observations of the various phenomena connected with the instincts and habits of the lower animals, approaching changes in the weather. The subject is not without interest, and I have thought it would advance future observations, to collate to some extent what has already been said in relation to it. Observers will so be enabled to arrange their facts into two classes; such as are new, and such as are merely confirmatory of those already recorded. It may appear by this course, that there is not so much novelty in the suggestions, as has by some been apprehended. In putting these observations of record in our Magazine, I wish, however, to say, that we neither affirm nor deny them. The facts, as alleged, *may* be authentic and reliable. It can weigh nothing against their value, that we have not observed them. They may be accidental and delusive. Still, in view of the testimony by which they are sustained, it would be premature to assume that they are so.

It is altogether a question of observation—a question in deciding which the experience of the plow-boy, who testifies to what he has seen, is much more worth than the logical conjectures of the philosopher in the arm-chair of his library. He, with his book and his syllogisms, may invent theories, make stupendous guesses at the truth, and defend his plausible rationalities by much logic, and a well arranged assortment of assumptions and consequences. But the boy, who can only agree to draw one of the philosopher's inferences, provided the traces be strong enough, walks over his fields with his eyes open; watches the coming and going of the insects and birds; marks the habits of his pigs and geese, and can tell the worthy doctor of laws, much, very much that he would never have dreamt of in his barren philosophies. Let us have facts—all the facts; not merely such as accord with our own pet views. Theories and opinions that come to us by education and logic, are nothing worth in comparison with facts that come to us by nature and experience. If the former may be driven out of our heads by the latter, the sooner they are got rid of the better. The shepherd takes note of the bearing and direction of the trusty tail of the most experienced ram of his flock, and says—"Presently it will rain." The philosopher looks up with confidence to the fair and sunny sky, beautified by a few wandering cirrhi, and proceeds upon his walk, saying—"I think not so." The philosopher goes home a wetter and a wiser man that day.

But let us not allow too much to the sayings and predictions of the farmer and the sheep-boys. They may not always be relied on. But here we must discriminate. If quite as often wrong as right in their proverbs and instances, shall we not, by their failures, lose confidence in the accuracy of their prognostics? The discrimination to be made is this: Many of the sayings of the rustic are not his own; not the result of his own observations. He repeats them from the lips of his neighbors, or the teachings of his grandfather. They are current in his neighborhood, and he adopts them without examination. He cannot even say, from want of attention, whether they do not often, or indeed, altogether fail. He takes them upon trust, without investigation; and will regulate the sowing of his potatos, and the killing of his pigs, by the age and phases of the moon, because he is told it is best so to do. In these cases, "they say," or—"I have always heard so," is the only reason he can give for the faith that controls him; and here we find him often at fault—seldom, perhaps, justified by the event. Not so in the many cases, where he speaks from knowledge—where he testifies to that which he has seen—where repeated observation has confirmed his facts; and he is personally assured that his experience may be

relied on. On such points, we must assent to his better information; cautious, only, that he has not been misled by appearances, and that his statements conform to his observations.

Begging the reader to bear in mind, the justness of this distinction, I proceed to arrange as follows, the instances of alledged prognostications, by various classes of animals, that I find already authenticated by creditable rural authority. Future correspondence and reading, will, doubtless, enable me to add hereafter to the list. I solicit from all who take an interest in the subject, notes of such facts as may be in their possession, bearing upon the inquiry; whether their observations tend to confirm or disprove the statements here given.

ANTS.—The observation is common, that an unusual and concerted activity, in a family of Ants, indicates the approach of rain. The Ants become agitated, move rapidly about their nests, and take in their eggs, with an evident unity of purpose. The statement is as old as the days of PLINY and VIRGIL, and it is still much relied on.

ASSES.—The following couplets relative to these sensitive beasts, have had considerable popularity:

"When the Ass begins to bray,
Be sure you'll have a rainy day."

"'Tis time to cock your hay and corn,
When the Donkey blows his horn."

FORSTER says he had a donkey that always brayed before a shower; and, generally, some minutes before the rain fell.

BATS.—The flying about, in large numbers, of these creatures, late in the evening, gives promise of a fine day on the morrow. On the approach of bad weather, Bats conceal themselves in their hiding-places.

BEETLES.—Of these insects, the same observation has been made as of bats. Moths, and other crepuscular lepidoptera, do not make their appearance, when they apprehend rain. They make high flights only in calm, settled weather, and really seem to have a delicate sensitiveness to moisture and rain.

CATTLE.—I have often heard farmers foretell rain, on the strength of an unusual friskiness, and restlessness, on the part of their cattle in the meadows. A change either to wind or rain, generally follows their antics. They gather in corners, with their tails to the wind; extend their nostrils, snuff the air, lick their fore-feet, etc., indicating an uneasy apprehension of some change for the worse, coming.

COCKS.—A writer in the Perennial Calendar, has observed that when the Cocks keep up a miscellaneous crowing all day, particularly in summer, a change to rain is indicated. An unwonted clapping of their wings, and stretching themselves up on their toes, has a similar significance.

CROWS.—The peculiar cry of the Crow, just before a rain, in a voice entirely different from his usual fair-weather note, has long been observed, and commented on by a score of writers. "The difference," says GRUME, in a passage on Aratus, "though difficult to describe, is readily learned from nature." LUCRETIUS has some fine verses on the subject. The warning comes with a voice of authority. When crows fly high and steadily, fair weather may be looked for.

DUCKS.—The clamorous and repeated quacking of these, and indeed, of most waterfowl, is held to be a sign of rain. They make an unusual splashing, and fluttering in the water, and take long and sudden flights, about the same time.

FLIES.—These and other sorts of small insects become more troublesome, stick more perseveringly to the flesh, bite and sting more pertinaciously, and make themselves otherwise particularly disagreeable, on the approach of rain. The observation is held especially true, of horseflies.

GEESE—Sympathize with the ducks in their apprehension of rainy weather, and scream, and fly over the water, with great unanimity and activity. Their motions, and commotions, are much relied on, in the rural districts. It is noted, that when they fly in flocks, against the wind, a storm may be expected.

HOGS—Indicate their concern, on the approach of rain, and wind, long before the change is foreseen by man, by various, and, frequently, ludicrous maneuvers. They run squealing about, throwing up their snouts, with a defiant and disgusted air; or they dash about with corn-stalks or whisps of straw, in their mouths; or they rub themselves in the dust, whining in a peculiar tone, and jerking their heads in a brisk, emphatic manner.

LEECHES.—The motions of these animals, especially when confined, as indicative of changes in the weather, have long been relied on as unerring. During calm and pleasant weather, they lie quietly at the bottom of the glasses in which they are kept, but become restless, and swim about in manifest agitation, keeping near the surface, when a change to rain or wind is at hand. Their motions are said to be particularly energetic, before a thunder-storm. There are many authorities for this fact. The phenomenon is, doubtless, referable to extreme electrical sensibility. Why may not a similar sensibility explain the analogous uneasiness, at corresponding periods, of other animals?

MARTINS—Fly low before, and during wet weather, because the flies and other insects they feed on, do so. These latter always descend from high flights on the slightest apprehension of foul weather.

PEACOCKS.—There is more truth than poetry in the lines—

"Rain will fall,
When Peacocks squall."

I know of many, who rely upon this prognostic; which, indeed, is regarded by many, as infallible, even when a calm atmosphere, and a clear sky, give promise of fair weather.

PETRELS.—The gathering of these birds about a ship, is a sure token of tempestuous weather. The sailors call them the "Stormy Petrel," from this circumstance. They snuff the storm afar off, and seem to seek shelter from its fury, in advance

PIGEONS AND QUAILS—Are said by persons accustomed to observe their habits, to give unmistakable intimations of changes in the weather.

SHEEP.—That these animals have a presentiment of the approach of rough and unpleasant weather, is too well authenticated to be doubted. Their agitations and motions are similar to those exhibited by cattle and other animals, at pasture.

SPIDERS.—Where these creatures are abundant, the coming of rain is indicated by their leaving their retreats, and appearing upon walls and fences, in larger numbers than usual. They have, also, peculiar motions at such times, that those familiar with them, interpret into unfailing prognostications. FORSTER, in his "Natural Phenomena," says he has noticed them for years, and their presages seldom fail. Fair weather may be expected, when Spiders are seen spreading their webs freely and extensively, over the plants and shrubbery of the garden.

SWANS—Have the instincts of geese, in regard to weather premonitions. That their flying against the wind portends rain, is confidently asserted by many observers.

SNAILS.—No animals are more attentive, far-seeing meteorologists, than the common Slugs, and Snails of our gardens. Their indications of rain at hand, may be relied on twenty-four hours before it comes; and even, as some say, much longer. By changes in their color, and the motions of their "horns," their premonitions are systematically manifested. Contrary to the usual apprehension, they come out of their hiding-places, from under the stones and leaves, and out of their shells, when they have any, *before* and *during* rain.* They *drink*, chiefly by absorption; and hence expose them-

* CHARLES LAMB made a notable blunder on this point, in one of his sonnets. The frugal Snail, he says,

"Peeps out, and if there comes a shower of rain,
Retreats to his small domicile again."

Not so. He would retreat from sunshine and fair sky, but remain out with evident satisfaction, did he find promise of rain, or dull weather.

selves to the rain with evident pleasure, and anticipate its coming. Mr. THOMAS, a young student of this city, has made some observations on the habits of Snails, in this regard, but I am not aware of their character or value. They may be presented in our Magazine, hereafter, should they prove of interest.

The subject is suggestive and important. These meteorological indications, when they are accurate and reliable, are of high value and interest; no less to the naturalist, than to the farmer and ruralist. To read aright the phenomena of nature, is a higher and more useful and economical knowledge, than to understand the hights and variations of the mercury in the tubes of the barometer and thermometer. The question is, What is *true* in these observations? What are constant and attested phenomena; and then, What is their right interpretation? Facts and notes, illustrative of these points, I am solicitous to obtain. If these things are false and illusive, let them be exposed and put aside. J. W. W.

New Horticultural Societies

Are springing up on every hand, and promise to be of great service to those engaged in them, and thus they will confer a great benefit upon the communities in which they are situated. The Cincinnati Horticultural, like a maternal institution, is called upon for documents, through her corresponding officer, by the anxious agitators in various parts of the country—these he has supplied, so far as practicable, with such material as was at hand ; consisting of pamphlets, reports, pomological transactions, etc.; unfortunately his stock is nearly exhausted, ere the increasing demand is half supplied.

To those whose calls have not yet been answered, and to those who have not yet sent in their requests, the suggestion is thrown out, that very little *form* is necessary for such an organization as is needed. Let the right spirit prevail in the great cause, and the less legislation the better.

Winter Exhibitions.

The lead which has been set by the New York Agricultural Society, in the way of exhibitions of *Fruits, Roots, Grains*, and other agricultural products, at this season of the year, has been wisely followed by our neighboring State of Indiana. The fine list of premiums offered for various articles of this character, to be brought into competition, at the meeting of the State Board in January, will, it is hoped, cause a good display and active competition. Then too, the convention of farmers and gardeners will have before them abundant themes for discussion, either in the private chat of small circles, or in the more general efforts upon the rostrum or the floor. Those who cultivate the soil may, once in a while, send a Cincinnatus to the helm of state; but as a class, they are the most difficult of all people to bring forward in a discussion at a public meeting:—at such a meeting as this, surrounded by familiar associations, they will feel more at home, and the world very well knows that their words, upon such matters, are words of wisdom, and worth more than all the vapid though flowery orations, of all the members of all the learned professions that could be brought forward, to attempt to teach that, of which they seldom understand the fundamental principles.

Those Southern Apples.

The opinion has been expressed, more than once, in the previous volumes of this work—that each variety of fruit may have certain limits, within which its peculiar excellence, and highest flavor and productiveness, may be developed to the greatest perfection. This opinion has been only confirmed, by extended observations in different sections of the country; and though some varieties may have a wider range than others, and some may succeed upon very different soils, the truth of the proposition remains, and is even strengthened. It is notorious, that in this latitude, some apples that are long keepers in the northern sections of our union, are early winter fruits,

and the same varieties are said to be autumnal in their period of maturity, farther south. Upon these and similar data, it has been assumed, in previous pages, that the south must look for her winter fruit, among seedlings that have originated upon its own soil, and proved to be of good character, and ripened at the desired period. It is well that such men as Van Buren, Elliot, Camack, White and others, whose names do not now occur to me, have already been actively engaged in noting the fruits of their own region; and the orchardist of the south, would do well to be guided by the directions of these gentlemen. The rest of the Pomological world look with great anxiety to the reports from the southern committees, to be rendered to the *United States Pomological Convention*, at its next meeting, in October of this year, at the city of Boston.

Farmers' and Gardeners' Meetings

Should be organized in every neighborhood—these may be called Farmers' Clubs, or Gardeners' Associations—there need be but little formality about them—all that is requisite is, an agreement to meet at each other's places, or at some central point, for the purpose of comparing notes upon the great subjects that should engage their attention, for the expression of views upon culture, prospects of trade and crops, and for the interchange of periodicals, relating to their particular interests. When any one of the company may feel disposed, a lecture might be given, or an essay read, as the basis for discussion, by the rest of the company. If the meetings be held at the district school-house, or other central fixed place, the nucleus of a library and museum, formed by contributions of books and papers, and objects of interest, will form a valuable adjuvant and additional bond to hold the association together.

The Farmers' and Gardeners' Clubs will be a source of great good to all concerned, and we hope to see them established in every neighborhood of our country, and surely in every village. J. A. W.

The Frontispiece.—St. Lawrence Apple.

This beautiful fruit, though not new, may be a stranger to many of our subscribers, and is presented as one of the decorative fruits, to which class it essentially belongs. Every person must be struck with the beauty of the picture, much more so with that of the fruit itself—the clear and distinct stripes of darker and brilliant red give it a peculiarly marked character, while the green about the stem almost leads one to suspect the pure white tissue that is concealed within, and which rivals in whiteness that of the famous Snow-apple. Like it too, as indicated by its name, the St. Lawrence is of Canadian origin.

This fruit has been cultivated, to a limited extent, in several places at the West, though not largely introduced: the specimens that have been exhibited at many of our Pomological meetings, have not always reached the perfection portrayed in this picture, which, however, is but a fair representation of numerous specimens. The St. Lawrence is decidedly a market fruit, saleable on account of its good looks, rather than by reason of its high flavor or peculiar excellence—it will make a fruit-stand attractive to customers, and, in its season, excels all others as a decoration for the table; contrasting admirably with the Maiden's Blush, which is much prized for such objects. Its general culture is not, however, recommended.

J. J. Thomas, in his excellent Fruit Culturist, describes the St. Lawrence as being roundish, slightly oblate, sometimes a little conical, obtuse; the whole surface broadly and very distinctly striped with very dark-red, on light greenish yellow ground; stem rather short and slender; cavity wide; basin round, deep, with a very obtuse rim; flavor rather acid; moderately rich, agreeable. A very handsome and productive apple, of good second-rate flavor, ripening about mid-autumn.

The drawing is after a plate sent by Jas. H. Watts, a noted amateur of Rochester, New York. J. A. W.

Horticulture in the South.

A PREPARATORY meeting was held at Augusta, Georgia, on the 1st of December last, when it was determined to organize a Horticultural Society. Committees were appointed to report to a future meeting. A Society in that land of flowers will have a labor of love to perform worthy of the men who have undertaken it. To this, and other similar associations we shall look for important aid, in our own enterprise.

We aim to establish a *national organ;* bound by no party lines, confined by no narrow geographical limits. Our mission indeed is co-extensive with the regency of Flora upon the American continent.

United States' Agricultural Society.

THE Second Annual Meeting of the UNITED STATES' AGRICULTURAL SOCIETY, will be held at WASHINGTON, D. C., on Wednesday, February 22d, 1854.

Among the objects of the Association are the following:

The acquisition and dissemination of the best experience in the Science of Agriculture;

The union of the men who desire to advance to its legitimate rank, this most important of all human pursuits; and

The increase and extension throughout our country of a more cordial spirit of intercourse between the friends of Agriculture, by whose countenance and co-operation this Society shall be elevated to a position of honor and usefulness worthy of its national character. Business of importance will come before the meeting. A new election of officers is to be made, in which every State and Territory is to be represented. Applications will be laid before the Society for the holding of National Exhibitions in different parts of the Union; prominent among these is that of the National Cattle Convention, at Springfield, Ohio. Delegations are solicited from all the Agricultural Societies in the country, and the attendance of all Agriculturists, who may find it convenient to honor the occasion with their presence.

MARSHALL P. WILDER is the President, and WILLIAM S. KING, is the Recording Secretary.

New Books.

THE AMERICAN HANDBOOK OF ORNAMENTAL TREES. By THOS. MEEHAN, Gardener. Phila. Lippincott, Grambo & Co.

We are much pleased with the design and execution of this little book, an extract from which we give below. The author has had much experience, and his observations, though brief, will prove interesting and suggestive to any one who would ornament his "place" with the most useful and desirable trees. The hints relative to soil and planting will be found to have a practical value to the amateur, and the catalogue of select trees, includes the most useful and available species of our American Sylva.

On the Selection of Kinds of Trees.

Firstly, we have to consider what the tree is wanted for, whether for shade, for ornament, or both combined; for utility or beauty; whether a rapid growth be desired, or the highest effects of the art without reference to time; whether they are to be planted singly, or together in masses.

A shade tree should have a widely spreading head, abundant leaves, or dense foliage. It should bud forth early in spring, and retain its leaves late in autumn. It should also be free from unpleasant odors and liability to attacks of disease or insects. All fruit-trees are objectionable. Who would choose a Lombardy poplar for a shade tree? The honey-locust has too fine a foliage. The odor of the ailanthus is unpleasant. The Kentucky coffee buds late, and the American buttonwood is too unhealthy. Still, there is great scope for variety. Fine selections can be made from among the horse-chestnuts and buckeyes, maples, some birches, ashes, tulip-tree, magnolias, hop horn-beam, English buttonwood, the oaks, sweet-chestnut, sophora, and in some parts or situations, lindens and willows.

But it is by no means in the majority of cases that trees are planted for the mere luxury of the shade they afford, or their utility in screening disagreeable objects. They are valued for the effect they have on the landscape; the beauty they exhibit in their forms; the cheerfulness that dwells in their foliage; the gayety that bursts from their opening blossoms, charms; and the contrasts they make with each other, please. To these, if they combine harmony with surrounding objects, expression of the artist's ideas, or association with classic history, or remarkable occurrences, they afford additional interest. These are points which few can master thoroughly, without long and careful study. Yet, on the perfection of this knowledge, depends the production of the most pleasing effects from ornamental arboriculture.

The effect to be produced by trees, should be particularly well studied. The object must never be lost sight of. Pleasure, in its broadest sense, is generally a main object; this is always to be derived from a perception of the beautiful. Unity, harmony, and appropriate fitness, are the essential elements of beauty; to these, then, must the planter's efforts turn.

The relation or fitness of a tree to the subject in connection with it, will be one of first importance in the study of effect. A tree, beautiful in some situations and in connection with some objects, will fail to please under other circumstances. A tree out of character is as offensive to the cultivated mind as would be a dress of the finest satin on the back of a beggar. So, an idea attached to a tree by association, gives it a character which cannot be removed from it without violence. A traveler, accustomed to associate the cypress or yew-tree with churchyards or monuments, would be painfully struck on meeting an avenue of them leading to a mansion. The same ideas hold good in the peculiar character of trees, as well as in their associations. A magnificent deodar, or even a Norway spruce, solitary and alone, would look as ridiculous by the side of one of our western log-houses, as a noble, weather-beaten, rustic-looking oak would alongside a magnificent modern specimen of city architecture.

We often hear the remark that evergreens around a mansion look so beautiful. Others again give a decided preference to deciduous trees. This difference of opinion can be accounted for on philosophical principles, and does not originate from any variation in the principles of beauty. Evergreens are the accompaniments of the thoughtful and the reflective. As we advance in age, the fondness for them grows more devoted. Their unchanging character suits the reflective steadiness that characterizes old age, and which draws our affection toward them as to bosom friends. Deciduous trees are emblematic of lightness and gayety; the young and untutored will always prefer them. Our happiest remembrances cling around the old oak of our childhood's home, without a thought or a care for the holly or the pine.

For these reasons evergreens should never preponderate around places, or in situations devoted to amusement or recreation. By schools, or places devoted to the young, they are objectionable in great numbers. Unsuggestive of lightness and gayety, they are opposed to the thoughtless, yet happy innocence of childhood. Wherever the aged love to resort, whatever is to have an air of solitude or peace, there is the spot which evergreens will adorn; here is the point from which they will really seem beautiful.

The selection of trees for effect can then depend upon no particular rule, fitness or appropriateness depending upon each circumstance; but unity and harmony are more general in their application.

Unity of design must not degenerate into formality; nor harmony into monotony. It is the frequency of this degeneracy that produces the opposite errors of irregularity and discord. One, in a mistaken view of unity, will divide his grounds into two equal parts, and an oak or an elm on one side must have precisely the same on the other, as if to balance the whole. Another, disgusted with such abortions of taste, plunges into the opposite error. His place has the appearance of having fallen into the hands of men of all principles, ages, and nations, each one of whom had successively stuck on a patch.

Variety is not opposed to unity. The oneness should be in the outline; the more varied, then, the filling up, the better. The carriage entrance to an old mansion is often improved by a row of trees on each side. Each set of two placed opposite to one another, should of course correspond. Yet there can be no objection to the successive sets of trees varying in species or varieties, so long as no rule of harmony was broken thereby. A light, airy-looking tree, like the hemlock-spruce, should not be placed immediately after a rugged, artificial-looking Norway. Its gracefulness would be in part absorbed by the rusticity of the latter, and both lose by comparison.

This harmony of color, shade, and contrast, is of more importance in the general arrangement of trees in a garden, than in such an avenue as I have described. They are to be looked at in greater masses, seen from more distant points of view, or from more varied positions.

The colors, tints, and hues of the foliage at different seasons of the year, will then have to be more particularly studied. Much may be lost or gained in the effect of a single tree. The golden hue of a sugar maple in the fall, appears to great advantage followed by a sassafras with its rosy yellow tints; and this, again, followed by a red or swamp maple or tupelo, forms a beautiful combination. If we were to take away the sassafras and replace it with a British oak, the effect would be anything but pleasing.

Not only in color should there be harmony, but also in hight, habit, and appearance. All violent contrasts are opposed to natural beauty. In the oft-quoted language of Ray, 'nature never takes leaps,' but proceeds gradually step by step. Differing in variety, yet united in general principles, each clump or section of trees in a landscape will possess characters exclusively its own. Few mistakes can arise from planting trees simply; harmony and association with the objects alone being called for.

In planting for a wood or grove, it is frequently the desire to make a small place look larger. Every bend should possess some new or striking feature. A long walk around a wood will not please without an object. A visitor may be surprised at the extent, but to the proprietor it is wearisome. His pleasure can only be secured by a succession of ever-present, yet ever-changing objects of beauty along the course.

Thus the planter should be imbued with the principles of beauty. Without them his labors may excite only wonder at their extent or surprise at their variety; with them, he combines lasting beauty — a source of unvarying pleasure and delight."

ON THE USE AND ABUSE OF ALCOHOLIC LIQUORS, IN HEALTH AND DISEASE. By WM. B. CARPENTER, M. D., F. R. S.; with a Preface by Dr. CONDIE. Phila.: Blanchard & Lea. Cincin.: H. W. Derby.

This is a timely and commendable work. The author is one of the most distinguished Physiologists and medical writers of the British faculty; and received for the treatise here presented, the award of the prize of one hundred guineas, offered by a late English commission, for the best analysis and discussion of the topics embraced in the following questions:

The effects, corporeal and mental, of Alcoholic Liquors on the human system, in health and disease;

Should Alcoholic drinks form a part of the ordinary sustenance of man, particularly under circumstances of exposure to labor or extremes of temperature?

Are there any special modifications of the bodily or mental condition of man, in which the use of alcoholic liquors may be necessary or beneficial?

Is their employment necessary in the practice of medicine?

That these topics are ably handled, and illustrated by competent facts and experiments, may be supposed from the known philosophical and analytical powers of the author, and the fact that in the committee of award, were some of the most eminent names in English medical science. It is unnecessary to add that the conclusion of the treatise is against the ordinary use of alcoholic beverages.

EXPLORATION OF THE VALLEY OF THE AMAZON. By Lieut. HERNDON, U. S. N. Wash.: Taylor & Maury. Cincin.: H. W. Derby.

The information to be derived from this interesting narrative is new and valuable. The writer started from the Pacific slope, ascended the mountains to the source of the great river, aud descended its banks to its mouth on the eastern corner of the continent. What he saw and did he tells with much point and spirit, illustrating his narrative with some capital sketches of the natives and their villages, and occasional indications of the peculiar vegetation of that little-known portion of the world. We shall refer to the work again.

TRANSACTIONS.

The Cincinnati Horticultural Society

AT the annual meeting, held on the 9th of January, selected the following persons to preside over its destinies and sustain its existence during the current year.

President: WM. S. HATCH.

Vice Presidents: N. B. SHALER, GEO. GRAHAM and A. H. ERNST.

Treasurer: WILLIAM STOMS.

Recording and Corresponding Secretary: JNO. A. WARDER.

Council: ROBT. BUCHANAN, M. MCWILLIAMS, M. KELLY, D. MCAVOY, W. HEAVER, ROBERT REILY, J. G. ANTHONY.

Librarian: JAS. W. WARD.

Fruit Committee: F. G. CAREY, JOHN SAYERS, Dr. S. MOSHER, M. MCWILLIAMS, S. S. JACKSON.

Flower Committee: F. PENTLAND, GABRIEL SLEATH, JAS. W. WARD.

Vegetable Committee: J. DUNLAP, R. KELLY.

A proposition had been entertained by this Society, to forego the Autumnal festival, for the purpose of aiding and not opposing the great Agricultural Fair of the State, which was expected to be held in the vicinity of this city during the month of September next. This proposition would not have met with any favor with the Society, but that the members were anxious to secure the best interests of the agriculture of the State, as well as to conciliate the controlling body, the State Board, which has, in previous years, misapprehended the position of this Society. It was sincerely hoped that no further obstacle would be thrown in the way of the proposed arrangement, but that the State organization would liberally meet the advances, and contribute, of their abundance, to the means of support which the Horticulturists propose voluntarily to surrender for the benefit of the central organization; but the Board have decided upon another location.

State Fairs.

AT a meeting of the Agricultural Board, held at Springfield, Illinois, January 3d, it was determined to hold the next Fair of that State, at Springfield, September 12th to 15th; subject to certain provisos that will undoubtedly be complied with by the citizens of that capital.

That of Indiana will probably be held at her capital also. The time selected, is the first week of October.

Michigan has selected the last week of September.

Illinois has also struck out boldly in the path of her predecessors, and as her people are deeply interested in labor-saving machinery, trials of implements are to be held at two different points during the coming season. That for corn-planters and grain-drills is to be at Jacksonville, to commence the first of May. The trial of harvesting machines, at Bloomington, on the 5th of July, and to continue until the committee are satisfied. The machines to be at the place by the first of July.

Indiana State Board of Agriculture. Winter Meeting.

THE Convention of the Agriculturists of this farming State, was called to order, on Thursday, Jan. 5th, 1854, by the President of the Board, Gov. JOS. A. WRIGHT. This is a regular annual meeting appointed by law; it is composed of delegates from the County Societies, in addition to the regular members of the Board. Forty-five counties were represented in the convention, which indicates a very healthy extension of the interest manifested in the great agricultural progress of the age and country, since the meeting of two years since, when only eighteen delegates were in attendance. Beside the delegates, several of the farmers of the State were in attendance and participated in the general interest excited by such a meeting, with its valuable discussions; and there are even those from beyond the State limits, who are present, and who desire to see the exhibition of the products of the soil.

The important object of this meeting was to elect eight new Members of the Board, to fill the place of those whose term of office is about to expire, also to arrange the Schedule of Premiums for next year, and to determine the time and place of holding the next State Fair. These various subjects and their attendant details furnished many themes for discussion.

The exhibition, or winter show, is very creditable, though not yet nearly equal to what a winter show should be, and will in future years become. The broad plains and rich bottomlands of this State have sent in noble specimens of the great staple crop, the Indian corn. This grain is exhibited in great variety, and of excellent quality. Roots were not shown in great variety, but the sweet potatos were remarkably large and fine.

The apples, always a first boast of Indiana, were now beautiful and constituted a very fine show. Size, regularity, color, and all other requisites, were there to satisfy the most fastidious critic of such products. The Committee's Report upon fruits and vegetables will be found in the March number.

The meeting was characterized by the interesting and practical character of its discussions: these turned upon the crops, and the stock of the State; the value and practicability of Hedges, and particularly the Maclura Hedge-plant—the importance of the orchards and the selection of varieties—each of which topics occupied an evening session. Several Papers were presented, and some premiums were awarded—the Prize Essay of S. B. GOOKINS, on Rural Taste, will be found in next number, and is well worthy of the perusal and attentive consideration of Western Agriculturists. Other Essays were upon The Hedge, The Orchard, The Vineyard, and the use of Gypsum.

The question of the site of the Fair, was one that excited much spirited talk; many points were proposed as desirable for the location this year, among them the Capital appeared to be the favorite, although the idea of centralizing permanently was strongly objected to. Indeed, everywhere the great value of *circulating*, has been appreciated, and found to work well; a new set of farmers are excited by every change of venue, and those who have attended one fair will always wish to visit another wherever it may be. Indianapolis, however, does possess facilities of access which can be claimed by no other place. It will now depend upon the liberality of her citizens whether she shall enjoy the benefit of holding the next fair and entertaining the thousands of visitors who will always flock to see the collected products of industry and of her fertile soil.

Ohio State Board of Agriculture.

THIS body held a very busy and efficient working meeting, at Columbus, on the 17th ult., and following days. The attendance was good, and all appear to be men who will devote themselves energetically to the work in hand; this is as it should be, for the success of the institution is in their hands and must depend upon their efforts.

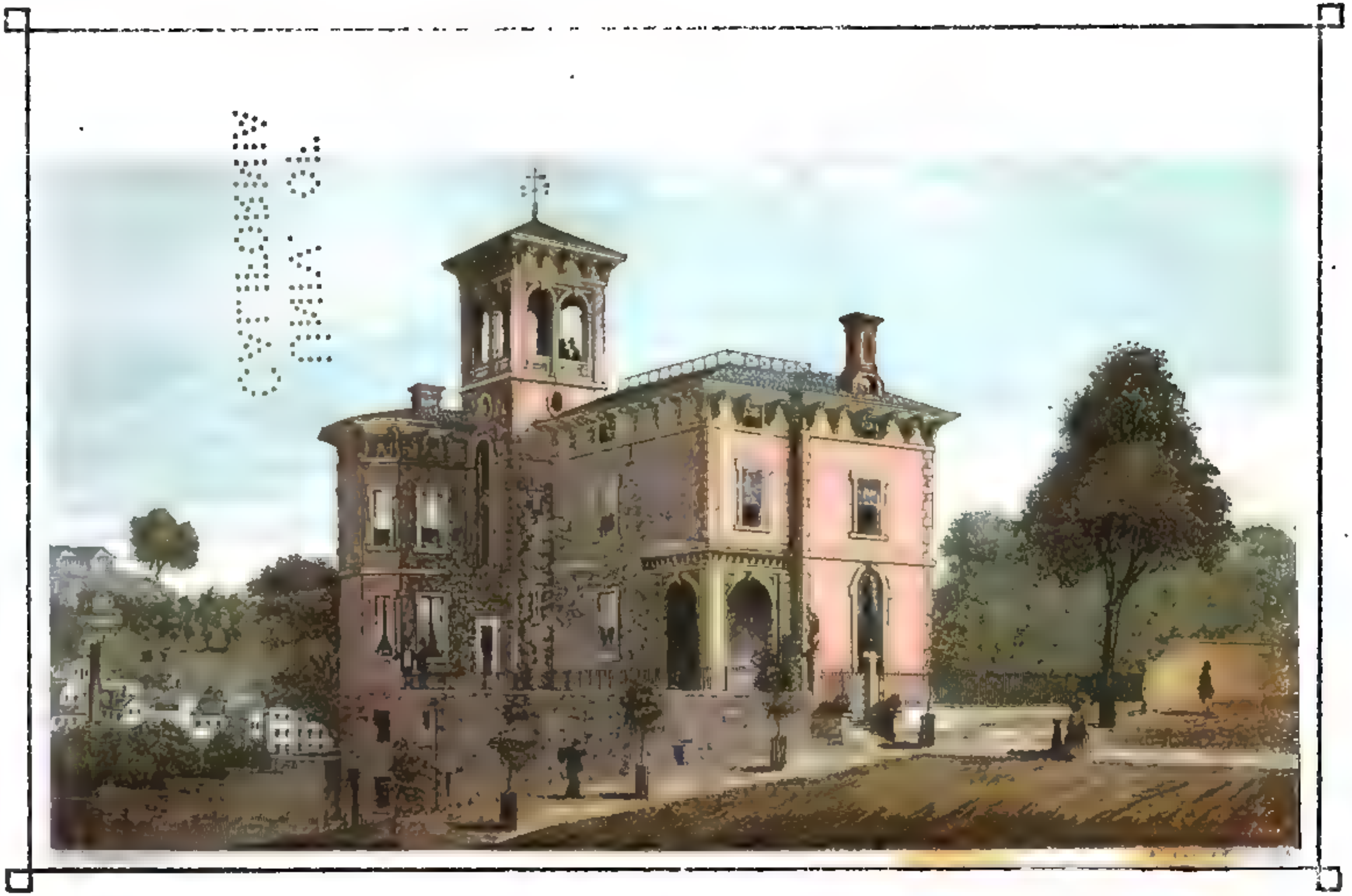
Next to arranging the premium lists, which need annual revision, and the selection of new committees, the great matter was to decide upon the location of the next Fair: the rotary or locomotive plan obtaining the most favor in the councils of the Agriculturists of this State, the Board felt it necessary to avoid any place at which a fair had been held previously, and in their wisdom, selected Newark as the site; the old Fort there will be suggestive of historic as well as agricultural themes to the hundreds of thousands of visitors who should annually flock around the agricultural standard of the State upon the occasion of her autumnal Jubilee.

Our own city, although of easy access from every point, in the center of an immense population, to furnish materials for, and visitors to the Fair, and with every appliance for accommodating any number of visitants from without her own limits, was also a competitor for the *honor* of holding the Fair and the labors of its attendant duties; but her advocates were few in number, and lacked the ability to persuade the Board that her interests and those of the country were identical and mutual.

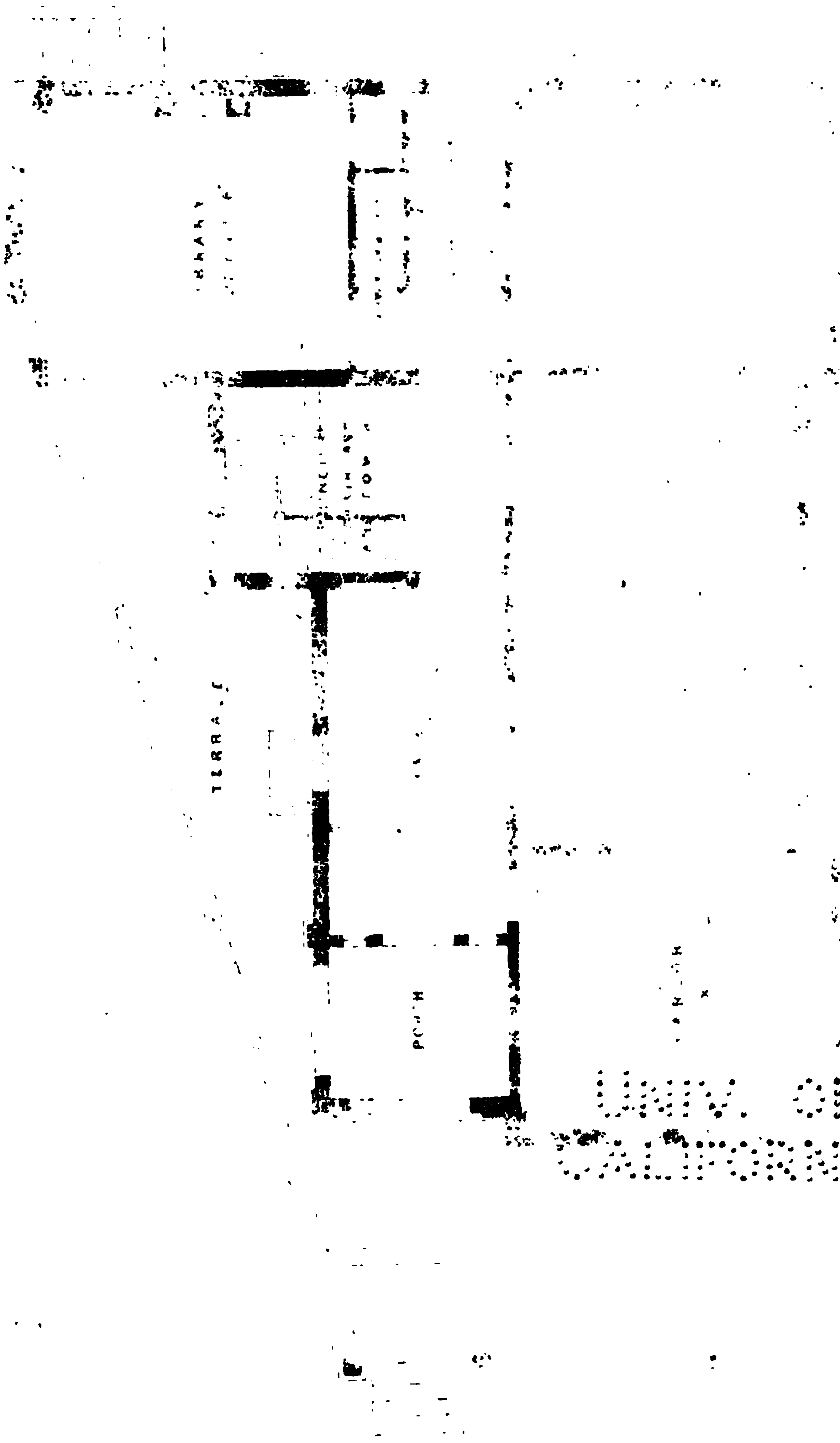
The Fair will be held at Newark on the 19th to 22d of September, the third week.

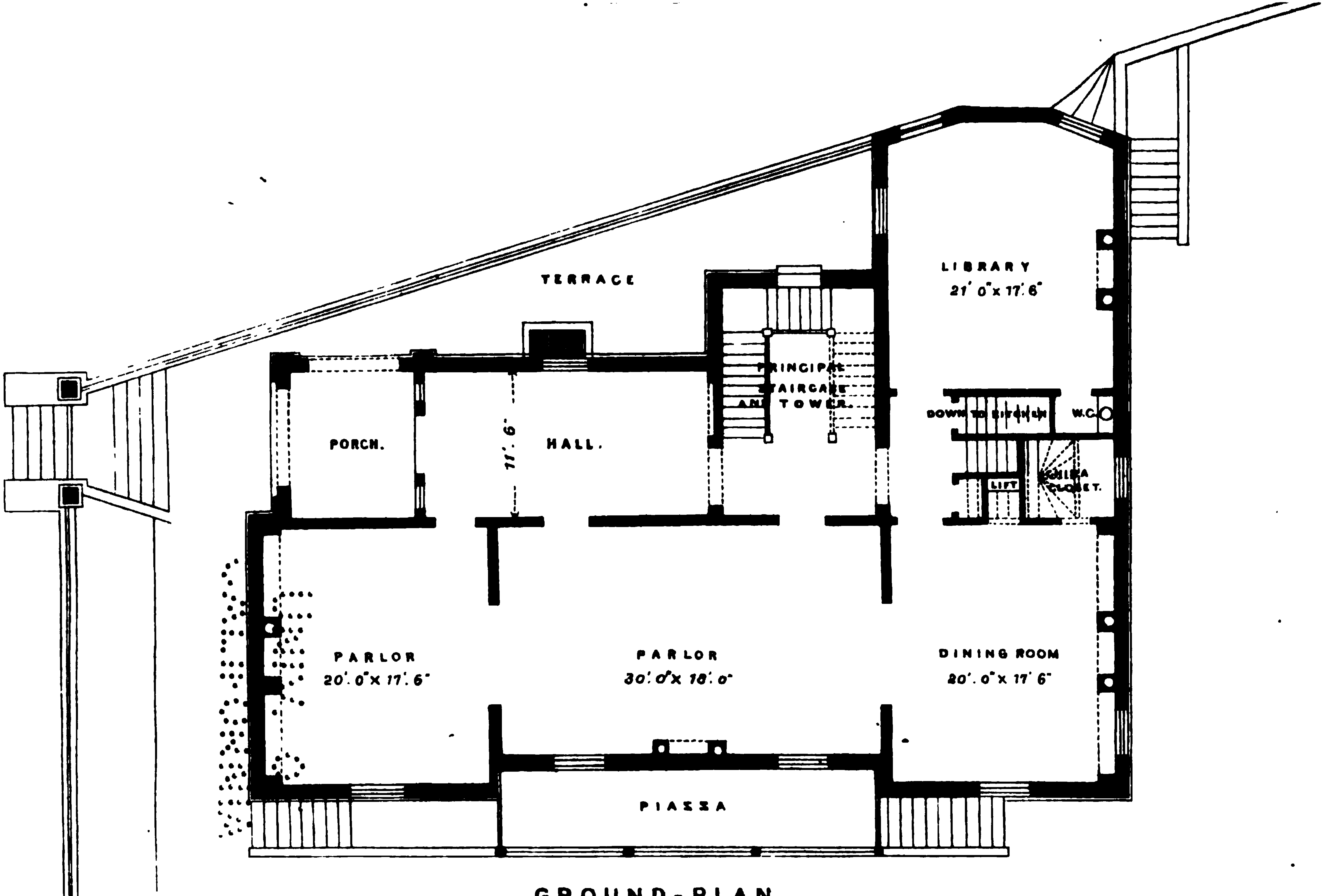
The modification of the Agricultural Law, in favor of Horticultural Societies, now without the pale of its benefits, which were asked for at a previous meeting, were taken under consideration and referred to a committee, who are to report at the December meeting of Delegates, when it is hoped the requests of these closely allied institutions will be fairly weighed and favorably set before the Convention, so that the Board may feel authorized to ask of the Legislature a change in the statute.

HORTICULTURAL SOCIETIES—Will please bear in mind our request to have them send us their proceedings, that we may incorporate them in our department of *Society Transactions*. If in printed form, let them be marked distinctly, as this plan saves the Editors a world of trouble, and insures their being observed and regarded. The most pleasant assurances have been received from several of our friends. Let us have your aid, gentlemen, and your money. We need your "material aid," as well as "your comfort," and contributions.



VIEW OF THE RESIDENCE OF CHARLES ANDERSON ESQ.
CINCINNATI





GROUND-PLAN.

Middleton & Wallace Lith. Cin.

The Grape—the Vineyard.

NO. III.—LAYING OFF—PLANTING.

After the ground has been thoroughly prepared, as previously advised, whether by the plow or the spade, an important and rather nice operation is to be performed before proceeding to plant the vines; this is called *Laying off* the Vineyard, and should be done with some degree of accuracy, since much of the appearance of snugness and finish of the place, will depend upon the correctness with which this is effected. A sufficient number of little sticks should be prepared; these are best made by sawing a straight inch pine board, into lengths of a foot or fifteen inches; these pieces are then to be split, and pointed, so as to enter the ground easily.

In the spring, these are taken to the field, and used to mark the spots where the vines are to grow, and there they remain during the first season, to aid the vine-dresser in finding the young tender thing, which is often very inconspicuous at first, though eventually destined to become a great vine. The distance at which these sticks are to be placed, will depend much upon the nature of the ground, its exposure, and also upon the manner in which it has been prepared, whether it be in benches or otherwise. The rows may be set closer on narrow terraces, than on wider levels, because of the more open exposure of the former.

Different views exist among planters, as to the proper spacing, and certainly different distances should be allowed for rampant and for slender growing varieties of the vine. Having stretched a line along one side of the space to be planted, a measuring stick is prepared, of the length determined, and with this the little sticks are set with accuracy, at the proper distances; the line is next moved to the width of the rows, and the same measuring stick is again used, in setting the stakes; great accuracy is required in these first two settings, because they will be used as guides to prove the remainder, so long as they remain in sight.

The very common distance, in most vineyards, is four feet each way, for the Catawba and other grapes, most cultivated, but the Herbemont, and some others, require more space, while the Missouri would answer equally well, as it grows here, if crowded more closely. The vine-sticks are often set 3½ by 4 feet, and 4 by 4, or 4 by 4½, occasionally wider, say 3 by 5, or even 3 by 6. Mr. Buchanan recommends, for steep hill-sides, 3½ by 4½, or 3 by 5, but, for gentle slopes, 3½ by 6, he says, is close enough, and for level land, 4 by 7, which will admit sun and air to mature the fruit, and leave space enough for the roots; he refers, of course, to the vigorous, native sorts, chiefly cultivated, and which are remarkable for their long, healthy canes, and exuberant foliage.

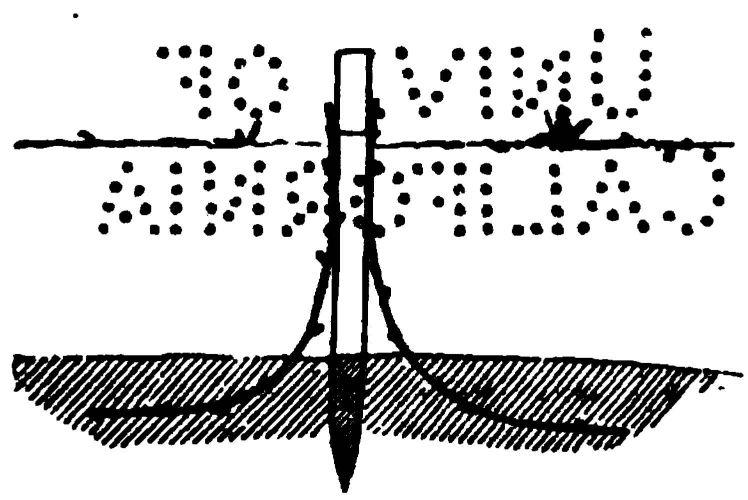
The number of plants wanted per acre, will depend upon the distance chosen; 3½ by 4 feet, will require 3112 vines; 4 by 4, 2762; 4 by 4½, 2420; 3 by 5, 2904; 3½ by 4½, 2766; 3½ by 6, 2075; 4 by 7, 1556; 3 by 8, 2815; 6 by 8, 908. If cuttings be planted, double these numbers will be required.

Planting.—After the ground has been properly laid off, the next procedure is planting the slips, or vines, whichever may have been determined upon. There are advocates for both plans, and there may be reasons why one or the other should be preferred, for different localities, and under different circumstances, depending upon the distance the young plants have to be carried, and the convenience of transportation. In some attempts which were made in Arkansas, owing to the irregularities in the navigation, and perhaps, also, a want of sufficient care in packing, the young vines nearly all died before reaching their destination—in such a case, the cuttings would, probably, succeed much better. Young plants are always to be preferred to old ones, and many prefer even to set out the cuttings, where they are to stand, and thus avoid the difficulty of transplanting altogether, nor incur the check and risk of removal. Tender as it is, however, the yearling vine, with its slender rootlets, will suffer less in transplanting, than an old vine; indeed, an experienced vigneron, will hardly accept such as a gift, preferring

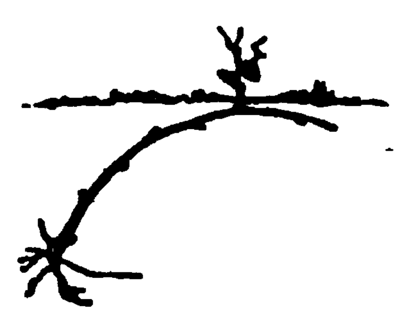
rather to wait until healthy young plants shall develop themselves, in the places where they are to stand.

If rooted plants are used, whether yearlings, or two-year old vines, holes should be dug in the trenched land, after it has become quite warm and dry, in the spring, say in April; these holes should be made beside the sticks set out at the laying off—and they must be large enough to accommodate all the roots of the young plants, without crowding; one foot by eighteen inches will generally be sufficient, and a foot deep. Few of the plants should be exposed at once, and they must be wrapped up in a damp cloth, to prevent them from drying; the vine should then be placed in the hole, and the roots carefully spread out, so as to come into a natural position, the stem being inclined to the stick at one side of the hole, and brought to the general level of the ground; the best loose earth is filled in among the roots carefully, and a cavity is left above them to retain moisture, until toward midsummer, when it is filled.

The plan of making a vineyard from the cuttings set out in the field, is now obtaining many advocates among our most intelligent cultivators, although it is ranked among the innovations or modern practices. The holes are dug the width of the spade, and extending a foot or eighteen inches beyond it, on either side, in the direction of the rows. Two cuttings, duly prepared, as will be indicated in another paragraph, are then set in each hole, bent somewhat as seen in the cut and inclined, so that their upper ends, or points shall come together, or cross one another, near the stick, beside the hole.



These points are brought up to the level of the earth, and the best and most mellow soil is filled in, and pressed gently against them, with the foot, the points being covered about an inch. Here, again, some recommend that each end of the hole be but partially filled up, for a month or two, so as to collect moisture from the rains, and also to allow the vernal sunshine, to heat the earth; for even common farmers, and dull vine-dressers, now begin to appreciate the necessity and value of earth-heat, or bottom-heat, for springing vegetation, better than the Horticultural writers of half a century ago; what was then looked upon as a mystery, is now well understood, since it has been explained upon physiological principles. The object in covering the crown of the cutting, is to protect it and its young buds from injury, by exposure, and especially to avoid the evaporation which would ensue, if it projected above the naked surface of the ground, with nothing to shield it from the bright sunshine and drying winds of spring. I am not aware that the "French method" of setting cuttings has been practiced in the vineyard; this plan consists of immersing both ends of the slip in the ground, springing the upper end somewhat, so as to throw it beneath the surface, while a good bud, near the top, is exposed, to make the shoot.



Cuttings, will have been made during the winter, when the vines were trimmed, and they should be prepared as soon as the branches are removed from the old vines, either in the field, the barn, or in the cellar; the latter is preferable, as they may be kept more safely from the effects of the wind, and may be cut up in rainy weather. The vine-dressers' shears are chiefly employed for this purpose, but a sharp, keen-edged knife, will leave a much smoother surface. In preparing the cuttings, all laterals and tendrils are first removed from the shoots of last year's wood; only such stalks are selected as are perfectly healthy, and well developed, and with short joints; a portion of the older wood, about two inches long, is left as a but-

ton, at the lower end, and the first cutting is made by applying the knife or shears, midway between two eyes, about fifteen or eighteen inches above the base; thus each cutting will have four or five buds; if the branch be stout and sound, it may still furnish one or more cuttings, which should be of similar length and proportions, but, having no older wood, to form the button, they must be cut off close below a bud. Some persons select their cuttings as they are made, believing that those cut from the base of the shoot, and having a portion of older wood, are preferable; these command a higher price.

The cuttings should be snugly tied up with long willow withes, in bundles of one hundred or two hundred, according to the size of the shoots, and fancy of the operator. They may be set up on end, in a damp cellar, with a portion of soil about their base, or better still, buried in a trench in the open ground, in a horizontal position, and left covered with earth until planting time. In the first position, if properly secured, they will keep very well, and will be accessible at any time, when wanted for sale; in the latter, they will be entirely secured from evaporation, and if they have previously become partially dried, they may be restored before planting, or if not restored, they will have turned brown, and thus show that they are not worth setting out, and should be rejected immediately. Another method of protecting the cuttings is to bury them partially, in an upright position—throwing the earth up about them, but leaving the upper ends exposed to the sun and air. If the bundles are large, they are apt to become dried in the center, and there is a consequent loss.

Those who bury their cuttings as a preparation for planting, often allow them to remain undisturbed until the buds have swollen, or even burst, before removing them to the vineyard ground for setting; this plan will require an occasional examination of the cuttings, lest they advance too far, which should be checked by disturbing, and then shading them. At planting, the greatest care must be exercised to prevent breaking off the buds, which may have started, and which are very brittle; few are to be taken at a time, and they should be kept covered by a damp cloth—the young shoots at the points of these cuttings, are not to be left exposed, when set, but must be covered with a little mellow earth, or they will surely die.

Treatment.—The young vines will need very little attention during the first season. If the soil be stiff and clayey, or disposed to bake into a crust, the points of the cuttings near the little stakes, must be watched, and the surface carefully broken, to allow the tender shoot to emerge. During the summer, the ground should be lightly hoed about the plants, and all weeds are to be promptly destroyed; every twig and every leaf should be left undisturbed, because of the important functions, that of forming roots, which devolve upon the new plant, which is now setting up an independent establishment for itself, and must, in future, depend upon its own resources. Should both these cuttings grow, in the vineyard stations, one of them must be removed in the autumn, either by cutting it off below the surface with a sharp knife, or by digging it up carefully, in order to appropriate it to some vacancy that may have occurred in the plantation, for new plantings, or for sale.

The *Nursery* of *Cuttings*, is an important part of the vineyard, or attache to it—in which the unsold cuttings are placed; its objects are the production of young plants for future extensions of the vineyard, and for filling vacancies, or for sale. In selecting a site for this purpose, it is best to choose a rich, deep, sandy mold; if in grass, so much the better. If the land has been drained, and so situated as to retain a good degree of moisture during the summer, the prospect of a successful "strike" will be much enhanced. In addition to all this, the recommendation of the old Roman COLUMELLA, is worthy of imitation; he advised cuttings to be dipped into a mixture of cow-manure, before planting them.

As deep tillage will conduce to the last-mentioned quality, immunity from drought, it will be best to trench the ground, and the cuttings should be set as the digging proceeds—therefore, this operation is to be com-

menced across the plat appropriated, and so soon as the second trench is opened, and the edge of the loose dirt is brought to a straight, even surface, by dressing it to a line, the cuttings are set, in a slanting direction, about four or five inches apart, and their points coming to the surface of the earth—the top soil is then dug and thrown upon the bases of the cuttings, after being mellowed, it is slightly pressed against them, and the lower soil, is placed on top, covering the shoots about an inch deep. The ground will settle and leave the upper eyes projecting, by the time they have begun to grow. The next row should be placed about eighteen inches from the first, and so on to the end of the plat.

The best season for setting out the cuttings, is a question of importance not yet settled, among those who plant—much must depend upon the nature of the soil; that which is very stiff, will have a tendency to throw out the fall-planted cuttings, by freezing and thawing; so, for those set in the vineyard itself, the exposure is prolonged by fall-planting—but in the nursery, where a sandy loam has been secreted, the cuttings should be planted as soon as they can be procured. It will be recollected, that I am an urgent advocate of autumnal-planting of nearly all hard-wood cuttings. I have seen the best success, also, with fall-planted grape slips.

During the summer, the young vine-plants will require very little attention, beyond the removal of weeds, unless the too heavy nature of the soil should cause it to bake, in which case, it must be stirred with the hoe, or spading-fork. If not removed the following winter, when they are called yearlings, the soil should be well stirred among the young vines, the next spring, to encourage a thrifty growth in the second summer.

In digging up these young plants, great care will be required to avoid injuring the roots. The row last planted, will be that which must be dug first, and the vines should be covered from the air as soon as lifted, tied up in bundles of fifty or a hundred, and immediately buried, as the long, naked, fleshy, fibrous roots, are very easily injured by exposure, and the vitality of the plants is, thus materially affected; indeed, it may be assumed, as an axiom, that no roots should ever be allowed to become dry, if success is desired after transplanting. Too much care cannot be bestowed upon these operations to prevent exposure to the sun and winds.

All cuttings received from a distance are better for being buried, as described above, as a compensation for the drying and exposure incident to transportation, especially when they have not been packed in tight boxes, which should always be called for by persons ordering grape-cuttings from nurserymen. It may be here observed, that rooted plants require still more care, in transportation; the boxes, in which they should always be ordered, need not, however, be so tight, but the roots should be well packed in damp moss.

J. A. W.

Culture of Rural Taste.

By S. B. Gookins.

Among those powers of the mind which survived the fall, a sense of the beautiful stands pre-eminent. It is not affirmed, nor is it to be supposed, that when the wreck of the soul involved all its powers in one general ruin, an appreciation of the beautiful endured the catastrophe, without a very material diminution of its limits and intensity. It is, indeed, probable, that but a faint impression is left us of the order, fitness, and harmony of the material universe, which was vouchsafed to the first inhabitants of Eden. But, notwithstanding the greatness of the calamity, so clear was the impress of the Divine mind upon the works of his hand, that they yet have power to excite in us, pleasurable sensations, in a high degree. True, the moral obliquity of the mind is, in some cases, so great, that only the "Vestiges of Creation," can be discerned, where those less prejudiced behold perfect order and universal harmony.

When the hand of the All-Powerful, peopled infinite space with its myriad worlds, the first great law of his government was order. Each globe and atom, was so disposed, relatively to every other globe and atom, as to harmonize in one all-pervading

purpose. The frailest mite that floats in sunshine, was weighed with the same precision as the largest sun or planet, and appointed to its destined place, that it might not mar the universal harmony. He who "stretcheth out his hand over the north, and hangeth the Earth upon nothing," who "taketh up the isles as a very little thing," who "weigheth the mountains in a scale, and the hills in a balance," who was the Author both of matter and of the law which governed it, adapted each to the other in an infinite series; and it is the opinion of the greatest philosophers, that the annjhilation or relative change of the smallest particle, would, like the dust of the balance, which causes one scale to preponderate, destroy the equilibrium, and, ultimately, involve the whole in chaos.

To the human understanding, a harmonious relation of parts, conveys the idea of beauty. True, this sense may be, and often is, perverted, like the other powers of the soul. The moral sense may be so perverted as to bring dueling (and, perhaps, other forms of murder,) to harmonize with its standard of right, and even to make it the basis of a code of honor. The physical senses may, likewise, be so perverted as to form a relish for the filthiness of the Hottentot, or, still worse, of the drunkard. The imagination may become so corrupt, as to revel in sensualism and impurity, and so an appreciation of the harmonious relation of parts, may become so perverted, as to see beauty in a flattened head, as among some of our Indian tribes, or in little useless feet, as among the Chinese women, or in compressed waists, as among other fine ladies that I have heard of.

All these improvements upon the handiwork of the Divine Author, have, doubtless, to the minds of some, imparted a higher charm. As originally made, they were pronounced, by a competent Judge, "very good," but then, it must be considered, that "good" is only the positive degree, whereas, these valuable amendments have brought them to the superlative.

Taste is the perception of beauty, and a correct taste is the true standard of judgment, in respect to the harmonious relation of parts. It presents us a very wide field of observation, comprising Painting, Poetry, Architecture, etc., and brings to the standard of judicious criticism, every product of artistic skill. It descends to the minutest particulars, and takes cognizance alike of a gentleman's morals, and the tie of his cravat; of a lady's manners, and the bow upon her bonnet. But I have no design to enter upon this field, at present, further than to consider the subject in a single relation, and that is, in respect to the embellishments of home.

American rural taste is now in its forming state. Some one is, perhaps, surprised at hearing rural taste nationalized; and he will ask, Has taste a local habitation and a name? I answer, Verily, it has; it is modified by circumstances, and what corresponds with good taste in one place, would be in bad taste in another. The capacity to judge is, of course, the same everywhere, but the subject matter varies according to circumstances. A marble column is beautiful, but introduced into the structure of an Indian wigwam, or a log-cabin, it would excite our ridicule and contempt. The social condition, the habits of life, the character of the climate, and many other considerations, determine the fitness of the appointments, and surroundings of our habitation. The roving tribes of the earth, construct their habitations in a style demanded by their habits of life. The Arab tent protects its occupant from the scorching sun of the desert. The Indian lodge shuts out the driving snow of the prairies. No inclosures secure the waving corn from trespassing animals, for there are neither corn to wave, nor cattle to encroach. He has no concern with seedtime and harvest. The abundance of fish and game, attracts the Indian, as does that of plunder, the Arab, and they move from place to place, accordingly.

The social state, as above suggested, furnishes one of the chief elements in the foundation of a national taste. A few centuries back, and the state of society demanded that every house, of any considerable pretensions, should be a castle, and, as a consequence, all architectural designs were modified by this circumstance. Our Saxon ancestors, in whom we now glory so much, were then, by profession, robbers and plunderers. What idea is expressed by the battlement, the turret,

the castellated wall, but that of security from aggression—of protection from violence; of stately barons, clad in armor, and of dependent vassals, seeking a refuge from lawless bands, in the shadow of the citadel? What is picturesque or poetical in the moldering wall, with its ivy drapery, but that it tells of the days of chivalry, when knight-errantry did homage to beauty? Wherefore sang not Ossian, of the softly resplendent glories, the mild beauties of the landscape? His muse, true to the inspiration of his age, has chronicled not these, but the unrivaled prowess, the high-souled daring of his hero, ay, and of his heroine too; for the spirit of the age allowed of no beauty that was not heroic. To a modern beauty, in all the potency of rouge, bustle, and blond, soft charms, and terrific fainting fits, (and no lady of delicacy, good sense, and refined taste, will suspect one of placing her in this category,) or to the modern exquisite, could the utmost stretch of his imagination have conceived of such a being, Ossian's muse would have assigned a place with harlequins, and other burlesques upon humanity.

Climate is also an important consideration, in determining the fitness of the habitation. A few years ago, a rage for Grecian architecture overran the world, and the Parthenon, and the Temple of Theseus, furnished models indiscriminately, for churches and dwellings, banks, barns, and wood-houses. Of late, the epidemic has run upon Gothic Cottages, with their steep roofs, and pointed gables. In the city, houses are built six stories high, because ground is worth one, two, or three thousand dollars a foot, and what would be said of the man who should build a house in the country six stories high, where land is worth twenty dollars an acre? And yet such a tenement would be in as good taste as the indiscriminate introduction of these model cottages. What gave the Gothic Cottage its precipitous roof? It was the climate of a country where clouds, mists, and rains so much prevail, that it is said the people sometimes take off their hats, and pay their respects to the sun, when his rays happen to appear among them. I suspect this to be an exaggeration, but that their climate is very different from ours, warm, dry, and sunny as it is, is no exaggeration.

Rural taste, in this country, will not, it is true, present the same unity of purpose as elsewhere, for reasons already hinted at. If climate has a controlling influence upon architectural designs, it is quite obvious, that a range of 25 degrees of latitude, and 75 of longitude, will make what is fit in one place, unfit in another; and when we shall have annexed all that adjoins us on the south, further modifications will occur; for when we get into volcanic regions, we must build our houses low, and of materials that will not be readily shaken to pieces.

The same may be said in respect to our social condition; for the servants' quarters, south of "Mason & Dixon" are as necessary a part of the home surroundings, as they would be useless and incongruous at the north.

There are, however, circumstances sufficient to give nationality to our rural embellishments. One has been already alluded to—our warm, dry, sunny climate; and this pervades our whole country, extensive as it is. The tendency of this fact, is to give to our architectural designs, the lightness, grace and elegance of the Italian style, with wide porches for shelter, and cool verandahs for shade, because our sky is like that of Italy. This circumstance is not peculiar to us, but there are those which are.

One great American fact will have a more potent influence, in the formation of our rural taste, than any other, perhaps than all others. We are a nation of landholders; if any one doubts the influence of this fact, let him set about planting trees and improving grounds upon the land of another, and if its power be not made manifest to him by the process, he must be a rare specimen of humanity indeed.

The eye of the traveler in Europe, rests with delight upon their magnificent displays of architectural and rural beauty, but they are mostly the offspring of concentrated wealth. Like the light in a picture, they stand out upon the face of the landscape, to challenge his admiration, and to draw his attention from the dark background of servil-

ity and vassalage, which surrounds them. In the present form of their social organization, it is necessary to maintain an aristocracy. Their law of primogeniture, and system of entailments, are retained for this purpose. But we have banished them, as inconsistent with the principle of universal equality, which we have incorporated into our political institutions. The tendency of one system is to concentrate wealth; of the other to diffuse it. That great wealth is often a patron of the arts, is true; but it by no means follows, that it is essential to a high development of taste. In the man of taste the artist has his patron. I have been through splendid gardens, the owners of which have set them up, as confectioners do their wares in the windows, to be gazed at and admired; and I have seen such a proprietor, who did not know even the names of many of his rare plants. The difference between him and his gardener was, that one possessed taste, the other, vanity.

We cannot have, therefore, in this country, overgrown estates, for the few, while leanness and poverty have to be endured by the many; and this is one of the most benign features of our form of government; it is a practical operation of the principle of equality, so happily introduced into our system. One man may labor and struggle through a lifetime to amass wealth, but there is no legalized aristocracy—no monopoly of privileges to hold it together—and the next generation scatters the hoardings of the preceding. This extensive proprietorship of the soil will therefore be found, as above suggested, to be the great controlling fact, in the formation of our rural taste.

Another circumstance which will enter largely into the formation of our national taste, consists in the fact, that we are a people of peace. It might not be easy to convince a Mexican of that fact just now, but it is nevertheless true. Peace is our policy, and it cannot be otherwise, than that its softening and mellowing influence should be thrown, like a veil of light, over our national taste. Posterity will find along the track of history, no baronial castles, whose puissant lordlings have held despotic sway over a territory, forty miles in extent; no ancestral halls, decorated with helmet, spear and cuirass, grim mementos of a blood-thirsty, revengeful race; no footprints of large standing armies, whose errand on earth was to scourge and to destroy.

The spirit of the age will also leave its impress here; a marked feature of which is an individuality of character, peculiar to a progressive period. It is, however, an individuality, which recognizes the relative duties and obligations in all their force; one that has taken the place of asceticism and seclusion—of veiled nuns and hooded monks. When we shall be numbered with the ancients, no moldering abbey, in the dim and misty retrospect, will lift its spires and pointed gables above the clouds of ignorance and superstition, in the midst of which its foundations were laid; but education, universally diffused, alike the hope of the patriot, and the theme of the demagogue, with its school-houses and colleges, and a ceaseless energetic activity, with the iron pen of the steam and the lightning, are erecting the monuments, and writing the records of the present era.

These circumstances, and many others, are to modify and give tone and character to our national taste, in respect to its architectural designs.

But forms of beauty are not limited to architectural designs. The mansion, however perfect, standing alone, conveys no impression of home. In such a spectacle there is neither unity nor harmony, both of which are essential to beauty. Without these there is no impression of fitness or adaptation, which, as we have already seen, good taste imperiously demands. No better field can be found for the display of a refined and cultivated taste than is opened to us here; for it is the surroundings of home that clothe it in a comely garb, and commend it to our admiration.

I have no time to enter upon the principles of the art of rural embellishment. The subject of Landscape Gardening is too extensive to be considered in a brief essay like the present; like painting and sculpture, it is the study of a lifetime. But this consideration need not alarm us. Every man need not be a graduate of a Theological

Seminary to enable him to think correctly in religious matters — nor need he be a Doctor of Laws, to learn how to avoid transgressions of the civil code. The practical use I wish to make of this subject is comprised in a single idea—I desire to see our American homes made attractive. I would have this thought engraved upon every domestic altar.

To make home attractive involves no great outlay of time or money. Put some such work as DOWNING'S Landscape Gardening in every school-library in the State ; let our Farmers' sons and daughters from such sources learn the principles of a pure taste, and my word for it, forms of living beauty will rise up all over our land. Let not our Farmer friends object, as they are sometimes heard to, that these adornings are useless, and a waste of time. You are mistaken, my friend—a few trees, and shrubs, and plants, judiciously disposed, will well repay you for all the care bestowed upon them — if in no other way, in the enhanced value of your property. I know an instance in which a small tenement, with a garden attached, upon which some care had been bestowed, but in which there was neither an exotic, nor a costly shrub or flower, was sold, a few years ago, for $1,100. The garden was allowed to go to waste, and now, although property in the neighborhood has been steadily on the increase, it would not produce half that sum. This is my own experience, for I sold the property myself. Every one knows and feels how differently he is impressed with the spectacle of neatness and elegance on the one hand, and carelessness and neglect on the other ; and this is an impression that will find its way to the pocket, whether he is buying or selling.

But the chief consideration is the moral effect of a refined and cultivated taste upon the country in general, and upon the family relation in particular. Let us indulge for a moment in a fancy sketch. — Here is the dwelling of a comfortable Farmer ; it is substantial, plain, unostentatious, but just in its proportions, and adapted to his condition and wants ; his grounds are judiciously arranged, and his tenement is surrounded by orchards and gardens, and embowered in roses and evergreens. These elegancies have cost him little. His stalwart limbs are usually devoted to the operations of his farm, but his eyes have also been opened to the beautiful in nature, and he has reclaimed a few hours from his more laborious pursuits, and planted a few shrubs and trees — kind nature has done all the rest. The club of Hercules was enwreathed in roses while he slept; so the sylvan graces have beautified his home during his hours of repose. His children have caught the inspiration, and with an appetite formed for these pure delights, what vicious pleasures shall have power to draw them thence ?

Now, here is another home, if home it may be called.—The tenement stands by the roadside, and in default of a gate, you enter the premises by climbing over a rail-fence — the house, bare and bald, has neither a porch for sunshine, nor a tree for shade, and the Floral embellishments are (JAMESTOWN), Jimpsonweed and Dog-fennel ; there is an orchard, the trees grown round with suckers, and the limbs covered with caterpillars' nests ; the garden vegetables consist of Rag-weed and Crab-grass ; the front yard is covered with chips from the last winter's wood-cutting ; as you approach the door, instead of the rose or honeysuckle, your olfactories are saluted with a rank smell, compounded of various odors, in which worm-seed, and stale bacon-rinds predominate ; a rough-haired, shaggy-eared calf, and a dozen runty pigs occupy the yard ; and as you enter, you find that the outward appearing is a fair type of the arrangements within, which are too familiar to need description.

The proprietors of this home may be well-meaning people ; their endeavors for the welfare of their children, may have been very honest ; but have they made this home the place of all others on earth, to which their hearts turn with delight ? On the contrary, for the want of those refined tastes and pure pleasures, which an attractive home affords, is there not great danger that they will go forth to the world in pursuit of those enjoyments, which minister to the grosser appetites and passions ?—Give your son a taste for cultivation, and you will have furnished him a fund upon which he can draw for the pleasures of a lifetime, with no danger that a single draft will ever return dis-

honored. Give him a garden spot, and a spade, and that spade shall be a trump, that will win him purer delights, than he can find at the gaming-table. Give him a Durham calf for a pet, and he will never become the pet of the coffee-house keeper. Give him a Berkshire pig to raise, and he will leave the "striped pig" to those who "feed on garbage."

It is to the country especially that we look for the saving influences of society. In town, the extremes of society meet; there is much virtue, but more vice; there is much refinement, but more degradation; and, consequently, the predominant tendency is to evil. The constant deterioration thus produced is counteracted by a healthy stream, flowing in from the country. Look where you will, and it will be found, that it is the boys from the country who make the *men* of the world.

Much has been said of late, and many things well said, about "Women's Rights." I do not know how it will be, ladies, when you get possession of the ballot-box. It may be that it will stop all the evils of the social state; but as this consummation is perhaps somewhat distant, would it not be well in the meantime, to look about for an indirect means of obtaining the desired end. Allow me to suggest, (and it shall be in confidence between ourselves, if you please,) that the power sought does not lie in the ballot-box, but far back of it. Your government machinery is a magnetic telegraph. Your legislation is only the instrument which delivers the message; the battery is at home, and you are the operators. The obscurest man in the meanest cabin in the state speaks, and the voice of a sovereign is heard at Indianapolis or at Washington; and what is the ballot-box? Merely an office on the way where the dispatch is re-written; it does not originate there.

An eminent British statesman said, "Let me make a nation's ballads, and I care not who makes its laws." Yet more aptly, a Grecian philosopher and legislator said his infant son ruled Greece; and proved his assertion by a very short process. The child ruled his mother; the mother ruled him; he controlled the council, and the council ruled the country. This, though designed as a caricature, exemplifies the true theory of representative government.

Now, whether it be necessary that you should go to the ballot-box in person, I shall not pretend to decide. If you were to forward a communication by telegraph, it would be of the first importance that it should be properly conceived, and sent in the right direction. You may go to the half-way office and see it re-written, if you choose, but it will be of little consequence. The proper effect will be produced, without putting yourself to any such trouble; for you control not the ballot-box merely, but the voter who deposits the ballot. You do not in person make our laws, but while modeling the intellect and the heart of the embryo citizen; it may be said of you, as a favorite New-England poet has said, when speaking of the inventive genius of his countrymen, "you make the machine, and make the thing that makes it."

The "Mothers' Magazine," will give you abundance of excellent advice about family government, and all that; but there is an element of power, to which it seldom if ever alludes; it is *home in its external arrangements*—that green spot in the memory, to which the heart will not return, — when fullness of vicious pleasures breeds disgust—because it never wandered.

The pleasures we derive from the embellishments of home, are not merely pleasures of sense. The eye is delighted, it is true, but there is an elevating, ennobling sentiment of the heart, brought into exercise by the care we bestow upon these objects of our regard. Who cannot remember, when in the days of childhood, he planted an apple-seed, a melon, a sunflower, or even an humble bean. How often, during the period of germination, did you visit the spot; and when, at last, you found the smooth surface slowly bursting up, and you peeped under, and saw the two first leaves—instinct of life, coming forth as it were, at your own bidding—how did your young heart dance with delight! and how did you go, day after day, to watch its development,

as one leaf after another was unfolded, and the stalk extended and finally the flower and the fruit appeared.

Nor do we in mature life, feel less regard for those things toward which we hold the relation of a foster-parent. We watch the growth of a choice rose or dahlia, or a favorite graft, with as much interest as the child did his sunflower. It is not difficult to understand why these things give us pleasure. The phrenologist would say, the organ of philoprogenitiveness is agreeably affected. I would say, God loves the excellent and beautiful works of his own hand, and He has imparted the same sentiment, in a degree, to us, whom He has fashioned in his own likeness.

In general, woman's heart is more susceptible to these impressions than man's. It is her peculiar forte to love, to foster, to cherish, and to rear. Old or young, she is the universal mother. Dolls and dahlias, babies and blossoms, children and chickens, are her delight, and all the 'women's rights' in the world, cannot make it otherwise.

Nor is the effect of these out-door employments upon her physical being to be overlooked. Woman should be feminine, not effeminate. If gentle, modest, pure, she is feminine; if pale, palpitating, fainting and fearful, she is effeminate. She may borrow a bloom from her rose, that rouge cannot give, and delicacy from her lilies, that flour and starch cannot impart. Healthful exercise will enable her to send all the rouge to those of her red sisters, whose standard fashions are blankets and leggings, and whose complexions need paint, if any do; the flour may remain in the market, to reduce the price and make it plentier for the poor.

I assure you, ladies, there is nothing either dangerous or indelicate in these employments. I know several females, who devote much attention to the business; nor have I heard of a single instance of any ill consequences ensuing. If you will allow me I will relate an occurrence which fell under my own observation.

It happened one day, that a man engaged in vending fruit and ornamental trees, called at a house in the country, when he found the owner absent. The lady examined his stock in trade—inquired his prices, etc., and found that either his prices were too high, or her funds were too low; at any rate, she discovered she could do best by buying at wholesale, and taking her trees at the nursery; in which was the further advantage, that she could then make her own selections. Having a spare horse on the place, she struck up a trade with the man, sold him the horse, and agreed to take his value in trees at the nursery. Her husband, entertaining pretty liberal views on the subject of 'women's rights,' did not interfere, but being engaged in business, which required his presence elsewhere, she had the management of the whole affair herself. Accordingly she got on board of a steamboat; went 25 miles; hired a team; went seven miles into the country; selected her trees; had them packed, and arrived at the river just at night. The packet was not to return until the next day, but finding another boat at the landing, she went on board, forgetting that she would reach home at midnight. She landed a mile and a half from home; the boat was to proceed before morning, and she did not know a soul on board. Now, here was the best chance in the world for fainting. In fact, a very delicate lady, might have got up a respectable turn of spasms on the occasion, but she seemed to think the most appropriate time for fainting had not arrived. Madam sent for the clerk of the boat, and requested him to attend her home, with which request he politely complied, as all such gentlemen invariably do. The night was dark, and the road longer than he expected, which led him to inquire if they were not lost; if they had not landed too far up, etc., but she quietly told him all was right. As they entered a grove near the dwelling, he held up his lantern and looked at the trees in amazement. Whether he had any serious forebodings of what was to become of him, I don't know, but he seemed to say to himself, "I will venture a little further." However, he got through safely, and returned to his boat. Her trees were brought home, and though she did not plant them that night, they grew and flourished, and still stand as living witnesses of what a woman can do when she tries. As for me, nothing very serious oc-

curred, except that I lost a horse by the operation.

You will please regard this anecdote as no part of my essay. It is merely introduced by way of illustration, to show that the lady of the household may clothe her dwelling in a comely garb if she will.

Here, then, is a field for the exercise of women's rights, the possession of which no one will contest, and the power of which none can deny. Here is a mine, whence the choicest gems of earth are dug, gems which adorn the home circle with those rich treasures of purity and love, which shall not fade when the purest carbon shall have lost its luster. Intellects developed, and affections molded under the influence of happy homes will be the source of our purest pleasures here:

> And when the frosts shall come,
> Transplanted, they shall bloom anew,
> Impearl'd with drops of heavenly dew,
> In their eternal home.

[Through the kindness of the Agricultural Secretary, I have been allowed to present this pleasant address to the public in advance of the Agricultural Report.]

Beauty in Architecture.

BY J. R. HAMILTON.

Before entering fairly upon the duties to which I was so flatteringly heralded in the first issue of this Magazine, viz: the illustration of "Rural Architecture," I would crave the indulgence of making a few remarks, upon Architecture in general.

My reason for this is simply that, in attempting to discuss the principles of Taste, which should guide us in the erection of our rural residences, I find it extremely difficult to confine myself to one particular branch of this truly noble art, without from time to time, taking a much wider range for the illustration of my argument. As throughout nature, the same majestic harmony and order are discernible, in the most gigantic masses, and the minutest atoms—from thundering Niagara to the dew-drop on the rose—from the huge leviathan of the forest, to the smallest blade of grass under our feet, so, the same universal and unchanging laws of beauty, and adaptation of means to an end, should be found alike in the gorgeous palace of the Monarch, or the humblest tenement of the Cotter, in some uncultivated wild.

It is almost impossible to arrive at any fixed standard of taste. "The sable Africans," says Mungo Park, "view with pity and contempt, the marked deformity of the Europeans, whose mouths are compressed, their noses pinched, their cheeks shrunk, their hair rendered lank and flimsy, their bodies lengthened and emaciated, and their skins unnaturally bleached by shade and seclusion, and the baneful influence of a humid climate." The Chinese think they make their feet beautiful by compressing them to shapes which we call deformity. In some countries, people wear their rings in their noses; our ladies, and Italian and Spanish men wear theirs in their ears.

But, although it is difficult to find a fixed standard of taste in fashion, there are certain immutable laws respecting art, by following which, we are certain to arrive at pleasing results, and a community of taste among all civilized nations. But for some such principle, how is it that we can extend our admiration to the various styles of Grecian, Roman, Egyptian, Gothic, and Italian Architecture, each one having its intrinsic excellence, and yet so perfectly dissimilar, that it would seem at first impossible to award the praise of beauty to the one, without withholding it from the other? This latent principle it will be my present endeavor to analyze.

In what then consists beauty in Architecture? Many ingenious arguments have been adduced, from time to time, to explain the peculiar sensation of pleasure or displeasure, which arises in minds refined by art, in contemplating an edifice. Alison, in his "Essay on Taste," Hogarth, in his "Analysis of Beauty," and Burke, in his "Essay on the Sublime and Beautiful," have sounded the subject to its very depths. Other writers, particularly of the German school, have endeavored to explain it by the laws of Æsthetics, which literally means perception by means of the senses; or, in other words, they would establish a science, whereby the first principles in all art, are derived from the effect which certain combinations have

on the mind, as connected with nature and reason.

It would go far beyond the limits assigned me, to enter into an analysis of all these theories. Suffice it to say, that the one great, leading, fundamental feature, which most of these writers agree upon, as the basis of all beauty in Architecture, and without which, indeed, no true beauty in design can exist,—is FITNESS—or manifest adaptation of means to an end. Without this leading principle, the most sumptuous edifice may degenerate into an unmeaning and ridiculous conglomeration of useless masses and ornaments; and with it, the most unassuming structure may apply to itself KEATS' exquisite image:

"A thing of beauty is a joy forever."

Fitness will, on examination, be found to be, the basis of all *proportion*, if not proportion itself. HOGARTH, who well understood his subject, agrees with ALISON, in considering that the emotion of pleasure, which proportion affords, does not resemble the pleasure of sensation, (such, for instance, as are derivable from sound and smell,) but rather that feeling of satisfaction, arising from the contemplation of means properly adapted to their end. In his "Analysis of Beauty," that great Painter places the question in its truest light, when, speaking of chairs and tables, and other common objects of furniture, he considers them merely as fitted from their proportions to the end they have to serve.

The truth of this must be obvious to every one. Place any intelligent man before a building, and ask him why its proportions please him. His natural answer will be, because the object, by such proportion, is, or appears to be, fitted for its proper end. Proportion is, in fact, but a synonym of fitness; for if the former be well contrived, and the several parts be properly adjusted to their end, that arrangement is immediately recognized as well-proportioned.

Fitness cannot exist in any architectural object, without a proper *equilibrium* in all the parts, as well as in the whole. *Stability* is the result of proper equilibrium, and anything in Architecture approaching to instability, or the very idea of it, is destructive of all beauty. A memorable instance of this, exists in the Leaning Tower of Pisa; or, to come nearer home, look at some of the lofty and narrow structures erected in this city—each trying to lift its flimsy and ambitious head above its neighbors, without any other regard to beauty, than the paltry advantage of a few additional feet in hight. Such buildings, if *really* capable of supporting themselves, without being propped by their neighbors, never *look* so. They are, consequently bad—must always be bad—and no amount of costly ornament, could ever redeem them.

Throughout nature, Beauty seems to follow the adoption of forms suitable to the expression of the end. In the human form, for instance, there is no part, considered in respect to the end for which it was formed by the great Creator, that is not to the eye, admirably calculated for the function it has to discharge, and, consequently, without an accurate representation of those parts, no Artist can ever hope to succeed.

It is true, that in Architecture, the mental process by which we compare the means with the end produced, is more subtle and difficult to be attained, than in such imitative arts as Painting and Sculpture, which are more directly founded on nature herself. We are all, comparatively, so familiar with the essential features in the human body, necessary to strength, youth, health, agility, and other concomitants of human beauty, that the most unpracticed eye, is capable of detecting errors in the productions of the Painter, or the Sculptor. A painting intended to represent an elegant female form, which shall make the waist encroach upon the region of the bust, or present the head, or hands, or feet, twice as large as the standard of nature, would be at once pronounced by the most uninitiated, as monstrous. A huge plethoric body of a man, placed upon a pair of spindle-shanks, would equally shock, by showing a human body, without its adequate support. Fitness and equilibrium, would be thereby outraged.

In an Architectural production, the same solecisms may exist, without being so easily detected; simply, because the multitude are not so accustomed to measure objects by the standard of taste in Art, as they are by that of Nature, but such solecisms are not

the less amenable to the laws of criticism and taste.

Place two men before a badly designed building, one an Artist, and the other totally unacquainted with Art, though, we will suppose, with some degree of refined feeling. They will both be displeased, though in different degrees. The ready eye of the Artist will at once trace the source of his displeasure, while the other will, probably, not be able to do so. The fact is, the Artist's eye at once detects that piers are put over openings, by which *stability* is endangered; that the windows are too lofty and crowded together, by which an air of weakness and painful excess of light are created; the pilasters are so slender, as to be incapable of rendering due support; or, they are so thick and short as to be unnecessarily strong, thereby producing a squat and clumsy appearance; brackets are piled upon brackets, with insane lavishness, and without any reference whatever to their use or appropriateness; costly balustrades are crowded upon the summit, and so hidden among projections, as to be rendered totally useless. All this the Artist sees at a glance. He knows how and where such a building violates *fitness*, *stability*, and every other true source of refined pleasure in art, and the cause of his annoyance is at once explained.

If we agree that Fitness forms the chief foundation of Architectural Art, the following maxims, if properly attended to, will promote fitness and beauty of design:

1st. Let that which is the stronger part, always bear the weaker.

2d. Let Solidity be always real, and not wrought by artifice.

3d. Let nothing be introduced into a Composition, the presence of which is not justified by necessity.

4th. Let Unity and Variety be so used as not to destroy each other.

5th. Let nothing be introduced that is not subordinate to the whole.

6th. Let Symmetry and Regularity so reign, as to combine with Order and Solidity.

7th. Let the Proportions be of the simplest sort.

8th. And recollect that nothing is beautiful which has not some good and useful end.

Decoration is a most important element in architectural beauty, and, perhaps, one of the most difficult to be properly managed. By the term decoration, is to be understood that combination of objects and ornaments, that the necessity of variety introduces, under various forms, to embellish, enrich, and explain the subjects whereon they are employed. Two rules it is important to observe, in decoration.

1st. It must actually be—or seem to be necessary. 2d. Such objects alone must be employed in it, as have relation to the end of the general object of the design.

Nothing shows the vulgar or unskillful mind of an Artist, so soon as false decoration. Its very glare attracts attention to its demerits. *All* parts of a work are not susceptible of decoration. The very *absence* of it is sometimes the best kind of decoration; and good taste alone can regulate where it is wanted, and the amount requisite. As in language, richness, and luxuriance of images do not suit all subjects, so in the arts of design, many subjects would be rather impoverished than enriched by decoration.

I come lastly, to *Unity* and *Harmony*, in a work, as among the most important features in whatever aims at the Beautiful in Art.

It will not, I imagine, require much argument to show that from a mixture of styles in any building, a want of unity and harmony will be produced, and that incongruity and unfitness, will necessarily be the result. Gothic doorways to Italian mansions, miserable skimmings of plastered ceilings, in Grecian form, to churches, caricaturing the solemnity and sublimity of Gothic Art, are surely monstrosities, to be condemned in any community, pretending to the least refinement in taste, or cultivation of the Fine Arts.

Imagine an Orator uttering a speech that shall be composed, alternately, of words from the Greek, Latin, French, and English languages. Imagine an individual walking out with one leg encased in the tights and top-boots of the Jockey, the other in the loose trowsers and slipper of the Turk; his body wrapped in the graceful mantle of a

Roman senator, and on his head the modern military cocked hat and feather. Not one whit more ludicrous and incongruous, would such combinations appear to the general eye, than many a daily perpetration in brick and stone, to the eye of true taste and refinement.

This comes from that morbid desire for *originality* at *any cost*, which forms the leading characteristic of the age, and from whose baneful touch even Art has not escaped. So many attempt to be *designers* and *inventors*, before they have comprehended even the rudiments of their calling.

What is termed a Style of Architecture, be it Grecian, Roman, Gothic, or any other, has its own peculiar features, which admit of no amalgamation; and the models of each, handed down to us from antiquity, may be regarded, and carefully studied as *Grammars* of those different styles.

The Orator, who declaims to us in the English language, makes use of the precise words, and even similes, that have been uttered by thousands, and tens of thousands, before him; but does he not, though making use of a language invented for him, find exercise for his genius in forming new combinations of thought, new illustrations, and fresh images, out of the very language he is using? Does he coin *words* to suit his purpose, or throw aside all the rules of the *Grammarians?*

Precisely in this position is the Architect placed, with regard to the art he practices. The laws and rules of Art, certain forms of moldings, and combinations of lines, universally recognized as prototypes of a style, are laid down for him by the wisdom and experience of past centuries of civilization, and none but the ignorantly daring will presume to substitute their own crude and undigested notions for the glorious examples of the past; to throw aside all trammels and precedent, in a difficult art, many a single branch of which would take them a life of industry to master its very principles.

For my own part, I am bound to confess, that after nineteen years of intense devotion to my Art—after studying the glorious works of former ages, in England, France, Italy, and Germany—bewildered and lost, as I have frequently been, before the almost godlike conceptions of the great minds, whose works have been handed down to us,—I, for one, find myself yet in the comparative infancy of my profession, and regard it a sufficient mental effort to take up and define the principles of the Art, as former ages have *laid them down.*

Let us be content to follow the lead of such as MICHAEL ANGELO, and RAFFAELLE, WREN, WYKEHAM, WAYNFLEET, and PUGIN. It is enough for us, their humble disciples, to follow in the path they have opened to us, and endeavor not to invent new systems, but to imbibe the spirit of their majestic conceptions, and strive to adapt them to the usages and requirements of the present age.

Well would it be for art, if this spirit was universal; 'gimcrackery' would not then be mistaken for invention; every insane innovation would not then be heralded as the triumph of genius; and, instead of our prosperous country being defaced by bungling, and often, hideous experiments in originality, whose only boast is their hight, or novelty, and the quantity of dollars lavished upon them, we should see rising around us, enduring monuments of true greatness, such as have formed the glory of ancient cities, and nations, and still endure, while all other record of their civilization has been swept away.

COLD ON PEACHES.—At the meeting of Pomologists at Chicago, last fall, it was stated by Mr. DUNLAP, that he had seen a fair crop of Peaches, in grass lands, where, the previous winter, the thermometer had been twenty-two degrees below zero; this abnegates the oft-repeated assertion, that a temperature of —12° will destroy the vitality of the peach-bud—indeed, it is now pretty generally admitted, that variations, rather than great depressions of temperature, are to be dreaded, for this fruit. SMILEY SHEPHERD, of Hennepin, Ill., had Peaches on a high situation, sloping northeast, after the buds had been exposed to —26 degrees; he had a tolerable crop, when the mercury had stood at —16, but believed they were generally killed at —12 degrees.

Fruit Report of the Winter Show at Indianapolis.

THE Committee on Fruits and Vegetables, have examined the beautiful display upon the tables, and offer the following Report for your adoption:

We have awarded,

For the best 12 Apples, 3 of each sort, to J. A. MATSON; $5 00

For Rambo, American Golden Russet, Rhode Island Greening, Esopus Spitzenberg, White Bellefleur, Yellow Bellefleur, Baldwin, Pryor's Red, Newtown Pippin, Rawle's Janet, Michael Henry, Lady.

Many of these are very handsomely developed, and very beautiful.

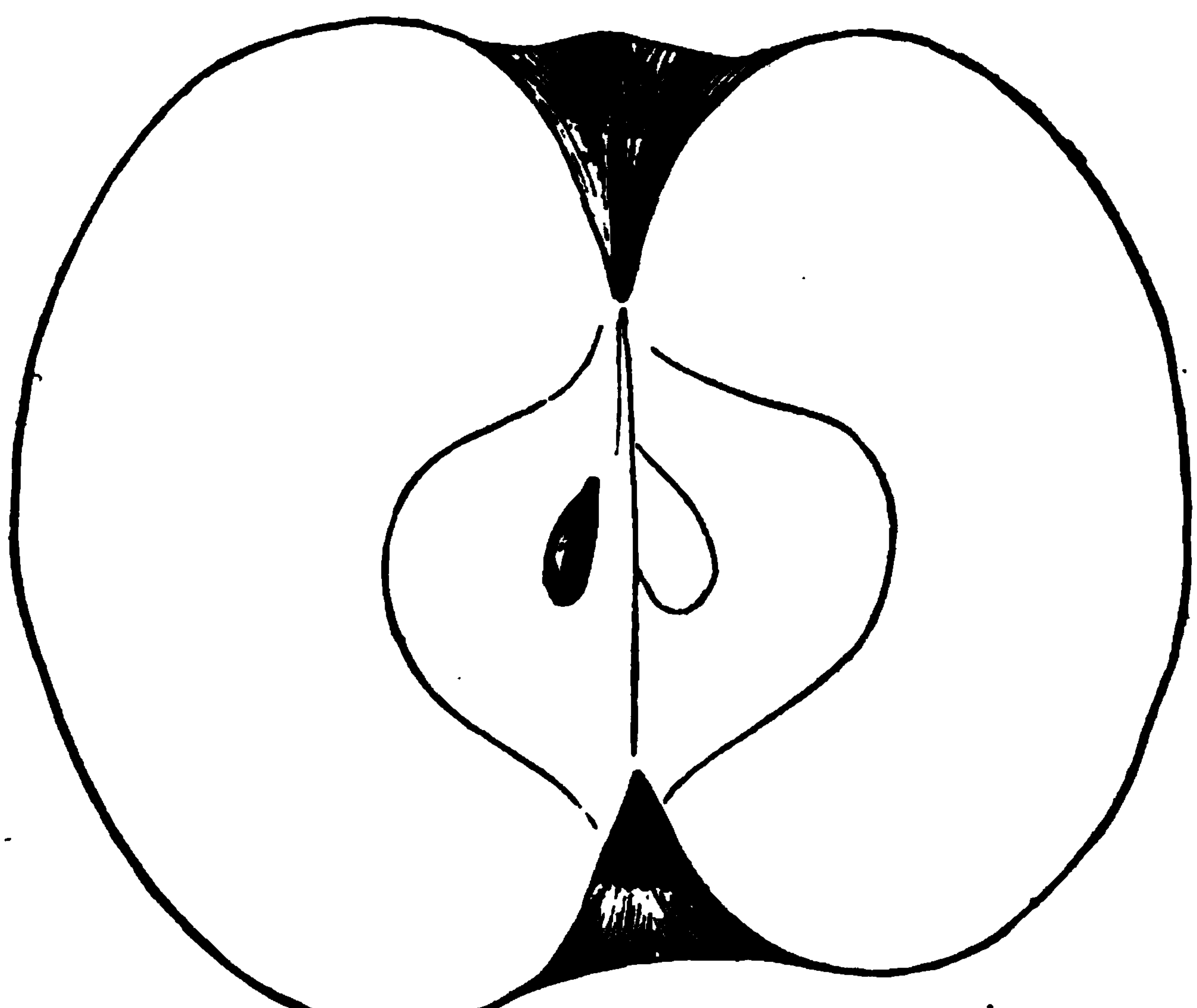
For the second best twelve Apples, as above, to Z. T. RAGAN; . . . $3 00

For these sorts—Rawle's Janet, President, Wine-Sap, White Winter Pearmain, Yellow Bellefleur, White Bellefleur, Esopus Spitzenberg, Baltimore Pippin, Newark Pippin, Pryor's Red, Black, Murphy.

For the best General Display, to JAS. ORR; . . . . $ 5 00

For the second best display, to POWELL HOWLAND; $3 00

Other collections attracted much of our attention, among them the twelve from GEO. DAVIDSON, of Wayne county, were much admired, and those of MR. BAKER, of Marion, came into close competition. Other lots of smaller size, were possessed of great interest; among these were the Newtown Spitzenberg, and a new Seedling, from H. SECRIST, of Putnam county, a description of which is appended.



SWEET SEEDLING.—Large, oblate; skin, smooth, yellowish-green, with a little bronzy blush about the base; spots scattered, rather large, round, purplish; also, submerged white marks about the apex; cavity, acuminate; stem, half an inch long, of average size; basin, regular, broad, and deep; eye, large, open; flesh, firm, close, and fine texture, juicy, sweet, agreeable; flavor, good. To this Seedling, a premium is recommended.—*Thomas' Fruit Book.*

We also find specimens of Vandervere Pippin, and Tulpehocken, both large and saleable apples, which, however, we do not consider praiseworthy, but are already planted too extensively.

Among the apples, were many specimens of great beauty and excellence, but we hope to be excused from the charge of partiality by designating the perfect specimens of the fancy apple, known as *Pomme d'Api*, or Lady, from JOS. ORR, of Laporte, which are such as would command any price, in an eastern market. They were grown upon a

clayey loam, underlaid by a stiff clay subsoil. Mr. BAKER, of Marion county, presented seven sorts, among which, some were very fine.

PEARS—were presented, but not in large quantities, nor extensive variety; one of the best was the Easter Beurre, from JOSEPHUS CLARK, of Aurora. As this is an excellent variety, we award a Diploma.

OF THE ROOTS—We were first attracted by the huge Sweet Potatos, presented by A. H. VESTAL, of Wayne county, which he calls, Nansemond, Bermuda, Southern Spanish, Red Yellow Flesh, and the Red White Flesh. These were accompanied by a model and pamphlet, descriptive of the method of sprouting, raising, and keeping, this admirable esculent. Although there was no competition in this article, the excellence of the sample fully entitles it to the award offered; $3 00

The sample of Irish Potatos, of good size and appearance, stood solitary and alone; they were called *Shepherd's Red*; they are not a very white-fleshed sort, and as we could not apply the test of taste, they are recommended as sound tubers. The contributor, CHAS. A. HOWLAND, reports that they were planted on clover lea, and raised in hills three feet nine inches apart, and that they are a very good sort.

Carrots, by JNO. CARLISLE, were good and large, but did not comply with the required measure. This crop is considered of so much value, as a food for stock, that we urge future attention to them, and by way of stimulus, recommend the award of a small premium.

A large Squash, believed to be of the Carthagena variety, was presented by FIELDING BEELER; this is a very good and prolific kind, of good quality for the table, and for stock, and keeps well in the winter. As an evidence of the value of these exhibitions, it may be mentioned that the seed of this variety was taken from a specimen exhibited at the State Fair, held at Indianapolis, in 1852.

Some Preserved Apples were shown by MRS. ISAAC VATAW, of Wayne county. The Broadwell Apple was used to prepare a rich molasses, in which, quartered apples were boiled—they are very sweet and good, and may be considered preferable to dried fruits. One bushel of the Broadwell Apple, boiled to a pulp, and strained through a flannel bag, furnished one gallon of sirup, when sufficiently boiled down. A copy of the Hort. Review and Botanical Mag., for 1854, was awarded to the exhibitor.

JNO. A. WARDER.
WM. H. LOOMIS.
JNO. T. FREEDLAND.
Jan. 6, 1853. W. GOWDY.

Maclura Hedges — the Way to Make them.

IN consequence of the great importance of the subject, and the urgent applications for advice, which are frequently made to me, I have concluded to occupy a few pages with an account of the present state of the HEDGE-QUESTION. The necessity and propriety of introducing live fences, has been sufficiently argued upon previous occasions, so that little need be said upon that branch of the topic, at this time. The necessity for this kind of inclosure, will depend upon the character and condition of the country; where timber of good quality abounds, or where easy access may be had, by water, or railroads, to a lumber region, or where stone is an incumbrance to the soil, these materials may be preferred, for fencing; but, wherever the ruthless ax has produced its havoc among the primeval forest growth, upon a fertile soil, which is kept under the tillage of the plow, with no mountain-ridges near, as a reserve for forest growths, the scarcity of timber soon becomes very apparent. So, also, on our naked, treeless prairies, "the green oceans of the West," those boundless savannahs, which stretch from one side of the horizon to the other, the want of timber renders the introduction of live fences a matter of great moment. Our friends in Illinois, fully appreciate this boon to their prairie country, introduced from a southern state. The *Maclura* is, indeed, a boon, because it has proved itself to be *the plant* for the purpose desired; it is hardy, vigorous, and a rapid grower; it bears clipping, or trimming, remarkably well; its foliage is beautiful, and it has, in every way, proved itself worthy of the highest praise as a hedge plant.

Without further parley or introduction, therefore, let us proceed to a detailed statement of the Maclura matter, from the seed to the finished fence. For, though it is not at all advised to commence with the seed, while plants can be purchased at the present rates, some persons among you will prefer, and in some situations it will be more convenient, to wait another year, and sow your own seed. In purchasing this article care should be taken that it be fresh, and that its vitality be perfect. Good seed is heavy and bright, and should give the sensation of coldness to the hand, when immersed into it. When crushed, it should have a plump, white kernel, and should not have a rancid flavor.

In a previous volume, minute directions were given, from absolute practice, as to the best methods of growing the seed, but as new readers appear, who may not have access to the directions then given, the importance of the subject will justify a repetition of the instructions: Having selected your seed, fresh and plump as the market may afford, not caring to have it remarkably clean from the naturally investing gum of the fruit, the first object, before planting, should be to scald it, by pouring upon it boiling water, which should be drained off, and the seed is to be then kept covered snugly, until it has swollen, and is ready to sprout; this will require about a week, more or less, according to the temperature. While it is in this state, it should be frequently stirred, to prevent the fermentation which would be very apt to commence in a large mass of wet seed.

In the meantime, ground is to be prepared by deep plowing, and thorough harrowing; if the soil be somewhat sandy, so much the better, as it will be less liable to bake, or form a crust above the young plants, as they issue from the germinating seeds, and start on their upward and aerial career.

The seed having been prepared, and the ground rendered mellow, by thorough tillage, and of all things, the weather being mild and pleasant, say, in this latitude, about the 1st to 15th of May, we may proceed to planting or sowing the seed, which should be done as follows: With a line stretched across the plat selected, shallow furrows are to be made with the hoe, as for planting peas or beans. These rows may be 18 to 24 inches apart, or more, so as to admit of horse tillage during the summer. In these drills, the seeds are to be thickly and evenly strewn, so as to lie about an inch apart, and immediately covered with a little fine earth, drawn up over them in a decided ridge, that shall bury them about two or three inches deep, according to the condition of the soil, as to dampness, and according to the dryness of the weather; shallow, if there be a prospect of rain, and deeper, if threatened with drouth. If you have access to a drill-barrow, that is adapted to seed of this size, use it by all means, as a labor-saving engine of great importance, and enabling you to distribute the seed with much more regularity than can be done by hand.

The object of throwing up a ridge over the seed, is two-fold; first, it shows you the precise position the young plants are to occupy; and, secondly, it enables you to pass along, just before they emerge, and remove the crust of earth which is apt to form after rain, and with it to destroy a first crop of young weeds; this is done with a light garden rake, and it is a very important aid to the starting of the young plants, in their first efforts to make their struggles in the battle of life, especially if the seeds have been intrusted to a clayey soil. Those of you who attempt to grow these plants from seed, in stiff clay soils, will experience great difficulty in getting the young plants above the surface, unless you pay particular attention to these directions; such soils will bake, and form a resisting crust, that will prevent most of the young plants from emerging; and in such a soil, you will also find the weeds very troublesome; whereas, by a light raking down of the little ridge, the crust, and an infinite number of weeds, are easily destroyed, and the young seedlings are not only freed from hinderance, but are really accelerated in their growth, by the culture thus applied.

The treatment during the season, consists of occasional culture of the soil, to destroy weeds, and to encourage the growth of the plants; it may be done with the Cultivator,

or Ruggles' new Subsoil Plow, drawn by a steady horse, if the rows be placed about eighteen inches apart. Indeed, no one should attempt to grow Maclura Plants, unless in a very small way, but by drilling the seed thickly, in rows sufficiently wide to admit of horse culture, hand labor is too expensive to be applied in this way.

The young seedlings will continue to grow until late in the season, and in the autumn will not have ripened their wood, but will frequently be covered with soft green foliage, when their growth is checked by the frost. Soon after this occurs, they must be cut off near the ground, either with a brush scythe, or, better, with the mowing-machine; after which, a furrow is opened near the outside rows, and the next passage of the sharp plow, will throw the plants out with the furrow. Boys then gather up the plants, either by hand, or aided by that useful implement, the potato rake, and tie them snugly in bundles of one hundred—using a willow, or packing yarn.

To preserve the young plants during the winter, they may be simply heeled into the ground, or placed in some moderately damp earth, in the cellar. In large quantities, they may be stacked up loosely, in the field, with alternate layers of earth, and covered over with dirt, as is customary with potatos, or turneps, the object being simply to preserve them in a moderately moist state, rather to prevent their exposure and drying, than to exclude the frost, which is not injurious except when the roots are exposed to the air and sunshine.

Digging the plants in the autumn has many advantages, among which are: the dryer condition of the soil, at that season; less hurry than in the spring; avoidance of the effects of frost in drawing them out of the ground, and injuring their bark, and the further convenience of having them ready for sale, and shipments, at a moment's notice. If left in the ground all winter, those that escape the drawing, and consequent injury by frost, are likely to start their buds earlier than those that were dug in the autumn; and thus they will receive a severe check, from digging, if this operation have been unavoidably delayed by the hurry of the season, or by wet weather.

Planting.—Those who expect good crops, and intend to produce them, are aware of the great importance of a thorough preparation of the soil. So with the hedge, its success will depend, in a great measure, upon the manner in which the ground has been prepared for its reception. Deep plowing, and even subsoiling, has been highly recommended. In the prairies, or other wild, uncultivated lands, the sod should have been broken up some months previously, so as to become mellow, and then deeply stirred in the spring, and freshly harrowed before planting, which should be done just as the plants are ready to start.

Two serious errors are frequently committed by hedge planters, which should be especially avoided; the first is crowding the line too near a fence—five feet is the least distance that should ever be allowed. The second evil, and one still more commonly observed, is crowding the plants too closely together; many persons recommend even a double row, at a few inches distant; whereas, I am satisfied, from the character of the tree, not only in its native haunts, but even here in the north, that it would be most unreasonable to expect success, health, and longevity, where trees, of naturally free growth, are crowded within certain limits. I have often observed and pointed out this error, and uniformly advise more space, and direct the stocks to be set in a single line, not closer than a foot apart; nor would I thank any person to furnish me a hedge ready planted, at six inches, in a double row, preferring, infinitely, a single row, at eighteen inches distance. On the other hand, I cannot, however, approve of another fallacy, which has been urged with some vehemence, that of planting at four or five feet apart, for the sake of economizing plants, by bending down vigorous shoots in either direction, in the expectation that a forest of upright shoots, will start up from every joint. Such a project must be followed by disappointment, and the reason may be explained upon the plain and simple principles of vegetable physiology. The higher buds are always

disposed to break first, and to produce the most vigorous shoots; if a strong cane of Maclura, be bent down toward a horizontal position, its elasticity will almost inevitably cause it to assume an arched position, so that some one bud will become the highest, and this will produce a leader or main shoot. Even though this horizontal training may be followed by an even crop of shoots, some one will very soon make itself the master; the rest will immediately become subordinates, and most will eventually die out, leaving gaps that will be troublesome.

Having determined this point, the mode of proceeding is to stretch a line upon the course of the future hedge, on the mellow and well prepared soil; a *clean* spade is pressed deeply into the ground, the blade being in a vertical direction, and close to the line, pushing the handle from you, a crack is opened to the depth of the instrument; into this the little plant is inserted, with the left hand, and retained in its position, while the spade is withdrawn, and until it is turned, with its face toward the operator, and again inserted, at a distance of three inches from the first cut, in such a direction, that when pressed home, the edge shall reach the point of the first cut, the place occupied by the root of the plant, when it is to be drawn firmly toward the plant, to fix it in its place. This operation is rapid and very simple; in its first introduction, the *blade* is to be perpendicular or vertical, with its back toward you; in the second, the *handle* is to be upright, and the cavity of the blade should be held toward the digger; observing this simple rule, the result will be obtained, and the plants will be rapidly and firmly set in the ground; the process is so exceedingly simple that any person may soon acquire dexterity in its performance; it is preferable to any other method of planting that I have seen. The distance may be regulated by the eye, and a little practice will give sufficient accuracy—I generally advise to leave the width of the spade, between the two consecutive openings made by the instrument, for the hedge-plants.

After planting, there is little to do during the first season, but to encourage the growth of the hedge, by keeping the ground perfectly mellow, with a frequent use of the Cultivator, so as to prevent entirely, the growth of weeds—vigorous shoots will spring up, and often attain the hight of several feet, with weaker stalks sprawling about near the ground. Let all grow; their business, or function, is to produce good strong roots that may be able to give us a fine crop of shoots the next season. Mulching the ground, instead of culture, has been recommended. The hedge will rarely require trimming during the first year.

Trimming.—During the ensuing winter, or early next spring, the whole of the wood is to be removed, by cutting off at the ground, with the scythe or mowing-machine; after this, in the early spring, the ground on either side of the hedge, is to be plowed; the furrows should be thrown from the row of stubble, and the spaces among the plants is to be cleared out perfectly, so as not to leave a spire of grass, or other intruder. Proper culture must also be continued, so as to allow nothing but the hedge to occupy the ground. In the month of June, or, so soon as the multitude of shoots that will have made their appearance, have become sufficiently woody to bear the knife, they are to be cut off with unrelenting hand, at four inches from the ground, which will reduce the hedge to a low level, although the horizontal branches may spread over one or two feet, or more, in width. A vigorous, and very thick growth soon follows, which may generally be allowed to grow until winter, unless the shoots be very vigorous, when they may bear another clipping, or shearing, in August; no rise should be made this year, however, of more than two inches at a time; so that the next winter-pruning shall not be more than four or six inches above the ground. This may appear to be a slow progress toward making a fence, to protect our crops from intrusion, but we should recollect that the labor we have undertaken, is one that is to stand for a lifetime, and it is all important to have laid a broad foundation, even if it require two years to produce a young fence of six inches in hight, but at the same time its breadth will be two feet or more.

No disturbance of the lateral shoots should be allowed, unless occasionally a straggler

may require to be shortened—these branches must be left to sustain the plant, which is thus severely pruned, and beside this, the lateral growth will be wanted, to give breadth to the future hedge, and unless the bottom is provided at the first, it can never afterward be supplied. If these directions have been well followed, you will have a good, thick, and broad foundation, at the end of the second season, which you can pass, only with a long stride, and into which, you could hardly be tempted to place your foot. In the winter, or early spring, the tender and frost-bitten ends, of late growth, may be removed, near to the late summer pruning of the previous season.

The third summer will require a very similar treatment, as to culture and trimming, except that the tillage will be much diminished by the width and thickness of the hedge itself, which should be so thick as to smother all other vegetation; nothing but Maclura should be allowed to remain, however, in the line of the hedge, and the occasional use of the plow or Cultivator, will suffice to keep down the weeds, and to encourage the growth of the plants.

The summer pruning should again be performed in June, but now it will not be necessary to clip so closely as during the last season, the shoots may be left four inches, or even six inches above the previous decapitation. Now, also, it is necessary to observe an important rule in hedging, a rule founded in sound philosophy, for there must be philosophy in hedging, or a failure will probably ensue without it—yet so simple is the rule, that every tyro, who has ever held a pruning-knife, or used his eyes among plants, must see and admit its necessity. I refer to the proper shape of the hedge, and which is now to be particularly impressed upon it. Every hedge should be so trimmed that every leaf and every twig should have the benefit of all the sunshine, air, and rain, or dew, that is possible for it to receive; this result is easily obtained by directing the cut, at this, and all subsequent prunings, in such a manner as to leave a sloping wall on each side of the hedge-row, so that an end view shall present the appearance of a broad low pyramid; never allow the sides to be vertical or perpendicular, much less, flaring outwardly as they ascend, and with a broad flat surface on top—which is the inevitable result of perpendicular hedge-walls. This is a very common form for a hedge, I admit, but, nevertheless, a very unsuitable one, and not justified by its frequent occurrence; on the contrary, the more condemnable is it, because, this very error is so disastrous in its consequences, as to have deterred many persons from hedging, when they beheld a high wall of bushes, surrounding and shading a field, with a perfect thicket of branches and thorns, from four to six feet above the ground, but beneath this, the naked and meager stems, that appeared thin and ghostly, scarcely hidden in midsummer by the scanty foliage upon the starving twigs, which were fast dying out, and leaving open gaps, to be filled with obtrusive and unsightly dead stakes, which the unwise hedger had been obliged to thrust in, to prevent the intrusion of the swine and other invaders. Such a result is, I am sorry to confess, by far too common with many of the hedges that may be seen all over the country, and such a result is inevitable, where the simple axiom I have repeated has not been the guiding principle of the hedger, even where the plants have been lavishly crowded at the planting.

During the third summer, then, the clipping must be continued, with as much severity as heretofore, but the requisite number of shoots having been previously secured from below, the consecutive cuts do not require to be so close together—six inches will do very well—and thus, after the June clipping, we shall have a double slope, or extended pyramidal hedge, with a base of three feet and a hight of about one foot, the two sides meeting at the apex, immediately over the line of the original row of plants. In a couple of weeks, when the new growth has again started, you will be delighted with the result; the effect will be hightened by the stronger central shoots, and the brilliant foliage cannot fail to produce a delightful impression. By the middle of August, or perhaps, earlier, the cutting must be again repeated, with another rise of six inches; sometimes three clippings may be practiced

with advantage, in the third summer. Great care must be bestowed upon the slope of the sides, which will gradually become more precipitous, but which must never be allowed to assume the perpendicular form.

If the soil have been good, and properly prepared, and the hedge kept under the proposed regimen, at the end of the third summer it will have become a *fence* against all but the most unruly animals, whether they be rabbits, boys, or bullocks, for, although either of the latter classes of marauders can look over so low an obstacle, a sort of natural instinct induces the desire, before undertaking such a feat, to see where they are to land, after performing a desperate leap; in pressing forward for this information, tney become too intimately acquainted with the thorns of the Maclura, and will almost invariably withdraw in disgust from the threatened intrusion upon the inclosure.

It is not, however, advised to turn out the hedge so early as this; in some soils the result will have been obtained, but in others it will be best to wait another season. The fourth summer from planting, the same general rules must be followed, except that culture is not needed, except where the soil may be thin, and there manure should be added, to encourage a free and vigorous growth. The trimming will become less and loss onerous, with each succeeding year, if proper regard be had to the simple formulæ that have been laid down—preserve the pyramidal form, and never allow the strong leader shoots to run away from the hedge, or to run away with it—if this caution be neglected, they will assuredly turn the fence *upside down*, that is, they and their branches, once escaped from their master, into the upper air, will soon spread out on either side, and intercept the invigorating sunshine, the refreshing dews, and showers, and the necessary air, to the inevitable destruction of your hedge — it will be turned upside down—the bottom and essential part of it will fail. Fortunately, however, no such actastrophe need be apprehended, as the overturning of the proper, pyramidal hedge dynasty, if only the broad foundation have been suitably laid in the beginning, and upstarts be restrained now. It is well known that the most vigorous growth is made by young trees, and that such a condition will not long continue, if a plant be subjected to crowding, and clipping, and a cessation of culture. Generally speaking, the Maclura hedge will cease to make very vigorous shoots by the time it becomes a fence; in this, it is as superior to the Honey Locust, as in its vigor and rapid growth, it is superior to the Thorn or Buckthorn, or, indeed, to any plant that I have had an opportunity of observing. Hence, the worst of the pruning labor is over by the fourth summer, when the hedge will be completed, and will require only a moderate degree of clipping and watchfulness, to preserve the requisite form during the remainder of its existence.

Implements.—Something should have been said of the proper tools to perform all this trimming. I have already alluded to the application of the brush-scythe, and to the mowing-machine, to the seedling plants, and to the year old hedge-row; the same implements may be called into requisition, with great propriety, especially the horse-power one, at the June cutting of the second summer, and at the August cutting of the same year, if such be found necessary; but, after this period, a horizontal cut is not advisable, and the mowers, as now arranged, cannot be properly adjusted for this work. I have great hopes, however, that hedging will soon require, and receive, aid from the intelligent Machinists, who are now forming an important era in the history of Agriculture, and that an adjusting hedge-clipper, upon the principle of the harvesting machines, will be provided by the Agricultural Machinists, so arranged as to give the required slope to the cut; horse-power will then come to the aid of the hedger finely. In the meantime, the sloping cut is best made with a long sharp knife, that is moderately curved, and set into a light handle, about four feet long, the blade being bent a little to one side from the axis of the handle, and well secured to it. The idea of this implement was taken from what I first had recourse to, after abandoning all the patent shears, and useless bill-hooks, that were furnished in the shops. This was no less than a common old grass scythe, which was bent fifteen degrees from

a right line, at about twenty inches from the point; for a handle, the remainder of the scythe was wrapped with cloth, and a capital tool was provided, with which a man would soon learn to cut off the shoots with rapidity, and leave a very even surface behind him. As the cutter advances, he should have the hedge at his left hand, and carrying his slashing-knife before him, edge up, and with his left hand advanced, by a succession of upward strokes, he will remove the shoots with very little effort; the necessary inclination of the blade, it will now be apparent, must be to the right, when the instrument is in use. It should not weigh more than two pounds, and must be kept very sharp. After the second summer, of course, the trimmer must pass along both sides of the hedge, to complete his work.

It has been asked whether Hedging was a Horticultural subject? Undoubtedly it is so, and it concerns the great interests of Agriculture, in its widest sense also. I am happy to find this view confirmed in one of the agricultural papers, from which the following is condensed; the authority is mislaid, but I think Dr. Kennicott will claim the paternity of the article, from which the extracts are selected. The views coincide so nearly with my own, that I am happy to call them in as corroborative testimony:

"The production of hedging plants is in the hands of professional Horticulturists, where the process of planting and rearing the hedges, for the first three years, should be also, until our farmers shall have been taught the principles of our particular branch of rural art and science.

The creation of live fences stands next to pomology, as a subject of general interest in horticulture. In accordance with this view, and by the request of friends, we put our opinions on record.

We have experimented with the Maclura, as an ornamental tree and shrub, nearly ever since we commenced the nursery business; but we do not deal in hedge-plants at all, and have no expectation of doing so hereafter. Our opinion is therefore unbiased by interest, except in the general principle, and our experiments have been made while doubting the hardiness of the plant, and our deductions drawn from much and varied personal observations and extensive personal correspondence.

We believe in the Osage orange. We believe that hedges of it may be made to stand our winter, as far north as Chicago, most certainly; and perhaps a degree or two further, under faverable circumstances. But to proceed. We have not enough rail timber left for the present generation, and we *must* have fences. What shall we substitute? Ditches and embankments have been extensively tried and generally abandoned. We must raise timber for post-and-bar fence or depend upon the pines and cedars of distant regions. We can grow the locust and perhaps other trees fit for our purpose in twenty years. Along our navigable waters and on the lines of railroads we can afford to build board fences, should the material rise in value no faster than the products of our farms.

A hedge will cost less and last longer than any fence, except the stone wall. A perfect hedge is the most efficient and the most beautiful of all, and subserves several other purposes, beside protection against domestic animals. An Osage orange hedge will protect gardens and orchards against pilfering animals of the *genus homo*—a great moral and jurisprudential desideratum.—When well grown, it will often arrest the unseen malaria of autumn and prevent periodical fevers. It will break off the cold blasts of winter and interrupt the heavy sweep of summer winds; and, in effect, serried squares of the Maclura hedge, subdividing every quarter-section of our vast and naturally defenseless prairies, may be expected to modify their climate and convert their original naked bleakness into clothed and sheltered tracts of genial mildness and rural beauty. This, in fact, has been measurably proved already, and there can be no reasonable doubt why hedges and orchards and timber plantations should not meliorate our prairie climate, as surely as they alter the cold, bare features which nature stamped upon our prairie land.

The experience of the Old world gave the new early lessons in hedging, and it was natural for us to try the plants here which succeeded there. We have done so, and all are failures. Our climate is too dry and our summers too hot to suit the best foreign plants. Of our native shrubs and trees, so far as we have experimented at the North, but three seem to answer. These are the Buckthorn, Washington thorn, and Osage orange. The two former of these will make good hedges in our region; but it is believed the latter will make better, if not the *best*, we can ever expect. This has been questioned. Let us inquire into the matter a little further.

The Osage orange is indigenous to a region very similar in soil and climate to this for which we write. Never quite as cold in winter, but much the same in spring, sum-

mer, and autumn; and, what we deem of most importance, the transitions are as rapid and nearly as broad in Missouri, Arkansas, and Texas, where this tree grows, as here in Illinois, where we propose to introduce it.

The first great principle in hedging is a broad, permanent, and impenetrable base. After this, with the Maclura, the one desideratum is ripe wood. To effect the first, cut down the plants in the spring; to secure the last, cut back the new growth in summer, and entirely arrest it early enough to cause the ripening of all the wood that must stand a northern winter. Where the growth is slow, less and later cutting will suffice; where rampant, no one will cut too much. Hundreds of these hedges without bottoms should be cut down to the ground, or near it at once, else they will never make perfect fences. We have cut down plants five years old, and four or five strong stems are the result of the one or two sacrificed.

We distrust thick planting, and believe that one strong root, with three or four stout shoots, is better than two weak plants with twice as many feeble stems. We are not prepared, however, to give definite directions as to distance apart. Perhaps eight to twelve inches, according to fertility of soil and boldness and constancy in cutting down for a base, may be near enough to the popular mark; and it may yet be proved that on our deepest and richest soils, especially if moist withal, a still greater distance, with proper cutting, will be most advisable. One fact is certain, thick planting or thin, there will never be a reliable fence without severe cutting.

In confirmation of the above, the editor of the Illinois Journal says:

Our agricultural committee have made examinations of Osage orange hedges in this county; and we found some that had been set only three years and then turned out—making an efficient fence against horses, cattle, sheep, hogs, pigs, and even chickens. We can now say 'Eureka!' We have found it. The Osage orange, in our county, has been *proved* to make a good and effectual hedge fence. I would strongly recommend, however, that it be cut back far more severely than usual, in order to give it a thick bottom; for on that its main excellence depends.

We find also that the prejudices of our farmers against this species of fence are fast giving way and the numbers of those who plant hedges constantly and rapidly increasing.

What a beautiful sight will the rich prairies of Illinois present when covered with farms inclosed by the Osage orange—and this is soon to be done in central Illinois.

I have often had occasion to say, with you, that by helping to introduce this plant, Prof. Turner has done more good in his day and generation, than if he had expended a long life in pounding Greek and Latin into the brains of that class who prefer ancient lore to living and useful knowledge.

Prof. J. B. Turner, of Jacksonville, Illinois, has a little farm of about one hundred and fifty acres, now nearly surrounded and subdivided into twenty-acre lots by this hedge, with gardens and lots of smaller dimensions. He says he will never allow another rail or board of any sort to be brought upon the place for fencing.

To make all these inclosures in the best and most convenient manner will require about four miles of hedge or other fence.

It would be impossible for him to obtain the cheapest sort of rail, or wood fence, for less than three hundred dollars per mile. This would, of course, make a bill in the outset of $1200.

On the other hand, the hedge well set in the ground, at the present price of plants, would not cost more than $25 per mile. Here then is a clear difference of $275 per mile, or say $1000 in the cost of four miles when first put upon the ground. The annual interest of $1000 is $100, which will hire a good, smart young man to tend the hedges, for five months in the year. Now if, in all coming time, a man be hired to take care of the hedges, and do nothing else for five months in the year, it is evident that the rails and the hedges would, on that score, just balance in actual cost.

But on the other hand it should be considered that it will take from three to four years before the hedges will be sufficient to turn stock. We will say the extreme—four years. Here there is a loss of $400 interest for which the hedge makes no return, but the rails do.

To offset this, it should be considered that about $400 worth of the wear of your rails will be gone in that time; for the whole fence will be virtually gone in twelve years, or even in less time than that; while your hedge at twelve years old, thus taken care of, will be fifty per cent. better than it was at four years old.

But, instead of its requiring a hand five

months in the year, it does not require one month, even in the most laborious and difficult part of the process, to take care of the hedge in the best manner — and after the third or fourth year it does not require the half that, for any man, who can swing a splasher, can trim a half mile of hedge, well enough for any farming purpose, in a day; an expert hand will trim a mile; and whenever suitable horse-power shears are introduced, the cost will be still further diminished.

In balancing his estimates of cost between the hedge and rail fences, he cannot make it come out any other way than that, in the long run, he will be at least as well off with the hedges and a good man hired five months in the year to take care of them, as he would with a wooden fence, in point of *cash cost*. In point of security and beauty there is of course no comparison. But all, who know anything about it, are aware that it will not cost even a fifth part of that labor, on an average, to take sufficient care of the hedges, even with the imperfect tools now in common use.

Here then is a clear saving of $80 per annum, and at the end of ten, or at most fifteen years, there will accrue another saving of at least the whole cost of the rail fence, which will all be decayed and gone, while the hedge will be better than ever before. Here, then, is another saving of $1200 more, or about $100 per annum.

On this place of 150 acres, requiring four miles of fence to put it in perfect order he calculates that he is saving at least $200 per annum, *in all coming time*, by using hedges rather than rails, entirely aside from the additional comfort, security, and beauty of the hedge.

As to security, all his fowls, consisting of some hundreds of hens, turkeys, ducks, guinea fowls, peacocks, etc., have been inclosed for two seasons past in a half-acre lot, with a seven-foot panel fence on one side, and a hedge on the other. They sometimes get over the fence, but never, to my knowledge, have they passed over the hedge.

On this farm there are some seventy-five or more hogs and pigs of all sorts, which run against a hedge which separates the hog-yard from the orchard and cornfields — and though the young pigs often get through the rail fence, on the opposite side of the lot, they have not been known to pass through this eighty rods of hedge.

Others, who followed the directions, have as good hedges, and some of them say they are better."

After alluding to the neglected hedges to be seen all over the country, the Professor observes: This is not all a dead loss; for the roots meantime grow strong and well, and these hedge-rows of three or four years old, may be cut down close to the ground in April, and after that be trimmed once in two or three weeks, and thus be brought into a good hedge in a single season, when the roots are thrifty and vigorous, and the soil well kept. I have done this repeatedly, where errors in the first management had been committed.

I agree entirely with Prof. Turner in his condemnation of the advice which has sometimes been given by others, recommending other and erroneous plans for hedging with the Maclura, and concur in the proposition, that this plant needs everywhere a great deal of severe dwarfing, by pruning, before it will reach a good and manageable hedge; and probably much more of it on the prairies than anywhere else. On some lands it needs at least twice as much as on others; and as a general rule, the richer the land the more frequent and severe must be the use of the splasher. Hence it is utterly futile to think of publishing directions which will apply to all parts of the country alike, with no regard to differences of soil and climate.

In his remarks, the Editor of the Prairie Farmer adds an important idea—the effect of hedges upon climate:

Connected with hedges is the question of CLIMATE. The preservation of our forest growth and the division of our prairies into twenty-acre lots, by the dense hedges of Maclura, would be equivalent to four or five degrees of latitude South during the growing season, and to half that in winter. This is an off-hand estimate of the effect on climate, yet it is not beyond the known probability. The beauty of hedges, when contrasted with wooden fences, is too obvious for further argument. And we think Professor Turner's economical estimates are not overdrawn in their favor.

A writer from Pekin, Illinois, comments upon the statements of Professor TURNER; he claims that it requires a fence to protect the hedge for four years; an item overlooked in the above statement; this with its losses and expense of hauling should be charged to the hedge, and amounts to a considerable item; then, he claims, very correctly, that the hedge will require at least an acre to the mile, for itself, to the exclusion of other crops.

He thus makes the hedge cost, for the four miles, $1397, while he sets the fence at $1200. He admits that it might make a difference if the fence were decayed and gone, at the end of twelve years, but claims a greater duration for the rail fence—this is based upon the condition of his own white-oak rails, that have been standing thirty-one years, were never re-set, and have never cost an additional rail, nor a dollar of expense! He also has a post-and-rail fence, that has stood for twenty-seven years, which has never been repaired, nor caused any expense, and which does not contain a broken rail, nor a decayed post—the former are white-oak, and the latter are post-oak—he thinks it will last a good fence, without repair, for ten years more.

This is changing the aspect of the question, and threatens to annihilate the practical claims of the Hedge, those of economy, for the beauty part is yielded; but, before deciding, let us inquire whether this is not an extraordinary case of durability of fence rails.

Another writer in the Prairie Farmer, perhaps one of the Editors, in an article upon Hedging, criticises the plan of allowing the hedge plants to have free and unrestrained growth the first season; he does not appear to set a sufficient value upon the plant requiring to be thoroughly established and well rooted, before the severe trimming is commenced. He asks:

To what purpose is all this waste? None whatever, that we can see. The whole season's growth is sacrificed, with the exception of what is laid up, in the shape of vital power, in the roots. With that exception we are no better off, or very little so, at the end of the first year, than at its beginning. Cannot we save something here, and during every subsequent year, till the hedge is grown. Let us see.

The object of cutting the hedge is *to stop its growth upward*, and force it to throw out lateral shoots, till it is thickened at the bottom, so that nothing can pass through it. Why cannot it be stopped at once, as soon as its growth is fairly commenced. In the first summer, the shoots have run up like a parcel of fish-poles, to eight feet in hight. They are now to be stopped by cutting them back to within five or six inches of the earth. Why could not this cutting have been done when the plants had only grown, say *eight inches* high? Then we should have had to cut away and lose but two inches or so, and when the growth had proceeded, say four inches more, two inches still could be removed. All that is wanted to stop the upward growth of a twig, is to cut off the terminal bud. Being stopped in this direction, it throws out side-shoots, and thus thickens as it is wanted.

As soon as they have grown to the hight of four or five inches—or sufficiently to enable us to strike most of the upward shoots with a cutting instrument, cut them back to within two or three inches of the starting point; when they have grown again to a hight like the first, cut them back again—leaving each time, from one to three inches of the new wood. The hedge would have to be cut several times in the course of the season.

It may be thought that this would increase the expense of the hedge, by increasing the number of cuttings. It certainly would make more work during the first years of the hedge, but less afterward; and enough would be saved, in the matter of time, to pay for the extra trouble, because the plant would lose nothing of its growth, as by these severe cuttings, it now does. The plants, too, would thicken immediately, and be much less liable to be killed by the winter, than if suffered to run upward into sappy, ill-ripened shoots.

I would, myself, much prefer to commence with a wild and utterly neglected hedge, of three or four years, strongly rooted, from which a good fence may almost be made the first summer after decapitation, than to incur the risk of weakening the plants, by a too early application of the shears—the "seven feet bean poles," cut off at the ground, the second spring after planting, are not a waste, they have left proportionately strong roots behind them, that will soon supply the place above ground, denuded by the clipping off of the bean poles.

J. A. W.

Blackberries — Their Culture.

Some persons, who have been accustomed to see this fruit growing in wild luxuriance upon our hills, may feel surprised at the suggestion to cultivate Blackberries, but those who know it only as a luscious berry, sold in the markets, care not whence it comes, and should indeed be delighted to learn that the Blackberry was extensively and profitably cultivated, for then we should feel assured that the fruit would be more regularly furnished, and, also, that it would be allowed much better to mature its fruit, than when snatched, by stealth, by trespassers.

The cultivation of this fruit has been urged, also, with a view to the selection of the better sorts, and the production of still better fruit, from new seedlings. To some extent, this has already been done, in different parts of the country, and we have some named varieties offered for sale by the nurserymen and propagators, in different parts of the country; among these, are the Lawton or New Rochelle berry, and the famous New England sort called "Lawton."

It has not been my good fortune to test either of these fruits, but a friend, in New York, writes to me, that he has partaken of the fruit several times, and testifies that its quality is very fine; he has planted them in

THE LAWTON BLACKBERRY.

the expectation that he will be richly repaid by the product. He has no pecuniary interest in the sale of plants, and urges attention to the Lawton, for the sake of advancing the progress of Horticulture. I saw vigorous specimens of this plant, at the farm of Professor Mapes, near Newark, New Jersey, which had given entire satisfaction.

The annexed cut is from a drawing of the leaf and fruit of this variety of the Blackberry, which may be ranked in quality with other productions of the Fruit Garden. Its

history may be given in the following extracts from the official report of the proceedings of the Farmers' Club of the American Institute, New York:

A splendid specimen of the Blackberry was presented to the Society, by WM. LAWTON, ESQ., of New Rochelle. Many of the berries were from three to four inches in circumference, and a large basket of them were partaken of by the members of the Club. Mr. LAWTON named the fruit the 'New Rochelle Blackberry,' but the Club changed its name to the 'Lawton Blackberry,' and tendered to him the thanks of the Association, the following paper having been read previously, by Mr. LAWTON:

This Blackberry—to which I have before called the attention of the Club—has been cultivated, in small quantities, for several years, in New Rochelle, Westchester County, where I now reside. I have not been able to ascertain who first discovered the plant, and brought it into garden culture, but am informed it was found on the roadside, and from thence introduced into the neighboring gardens. As it came to me without any name to distinguish it from the 'Wild Bramble,' I beg leave to introduce it to the notice of the Club as the 'New Rochelle Blackberry,' and, at the same time, present as a specimen, a few quarts of the fruit, gathered this morning, precisely as they came from the bushes, without being selected. I have examined many works, with a view to ascertain if there has ever been any improvement on the well-known wild varieties, but without success. The Blackberry seems to adhere to its original character with singular tenacity; or, from the many millions of plants which spring up from seeds annually distributed in almost every diversity of climate and soil, we should constantly find new varieties. Improving the wild plant, by careful cultivation, is one thing; to produce a new variety is another. The fruit now before you I believe to be of the last named character. It is not like the Dewberry, nor is it long and mulberry-shaped, like the 'Upright Blackberry,' and the seeds are so completely imbedded in a rich pulp, as hardly to be noticed. In shape and size they compare very well with the Hovey Seedling Strawberry.

The 'New Rochelle Blackberry,' sends up annually, large and vigorous upright shoots, with lateral branches, all of which, under common cultivation, will be crowded with fine fruit; a portion ripens daily, in moist seasons, for six weeks, commencing about the middle of July. They are perfectly hardy, always thrifty and productive, and I have not found them liable to blight, or injury by insects.

It will be many years before our citizens generally will be able to procure this fine fruit, as our large hotels and saloons will contract at high prices, for all that can be sent to market. But numerous private gardens may be stocked for family use, in three or four years, and in their turn aid in the distribution. Except that they are perfectly hardy, and need no protection in winter, the cultivation may be the same as the Antwerp Raspberry; but to produce berries of the largest size, they should have a heavy damp soil and shade.

Now here is a chance for some one who is desirous of improving this fruit by seedlings will find here a good starting-point, as seeds from this variety will lead off at least a length ahead of those from the common varieties. For a hybridizer, I should suggest the use of pollen from the Dewberry, or *Rubus trivialis*, as that species is early, and generally much more luscious than the Blackberry, or *Rubus villosus*. It would be interesting for some one to endeavor to hybridize with some of the Raspberries, which are classed in the same genus, though, I should apprehend that the analogies were not sufficiently close to insure impregnation.

APPLES FOR MILCH COWS.—A gentleman, who deals in facts and figures, as well as fine cattle, informed us that he had fed out last winter, more than two hundred barrels of sweet apples to his milch cows, and that the increased quantity, and richness in quality of the milk, paid him better than any other use to which he could have applied them. He states that he is growing trees annually, for the purpose of raising apples for stock. Another important statement of his, is, that since he has fed apples to his cows, there has not been a case of milk fever among them.—*N. E. Farmer.*

Ad Interim Fruit Report.

THE FRUIT COMMITTEE OF THE PENNSYLVANIA HORTICULTURAL SOCIETY REPORTED ON THE FOLLOWING VARIETIES:

The Water Apple—represented to be very productive. *Size*, medium, two and a half inches long by two and five-eighths broad; *form*, oblong inclining to conical; *color*, red on the greater part of the surface, interspersed with one or more white spaces, and a number of green blotches, greenish yellow about the crown and on the unexposed portion; *stem*, half an inch long and one-twelfth thick, inserted into a rather narrow, deep, acuminate cavity; *calyx*, medium, closed, set in a moderately wide, plaited, sometimes shallow, occasionally deep basin; *seed*, medium, brown, ovate; *flesh*, greenish white, fine texture, remarkably tender, juicy; *flavor*, sprightly, with an agreeable aroma; *quality*, "*very good*."

Seed of the Salmon Berry, from Bodega, California; and *dried Raspberries* from Sitka, in Russian America, near the fifty-seventh degree of north latitude. More than a year ago we learned from a reliable quarter that a Raspberry of very large size and fine flavor had been found growing in California. Repeated attempts were made by us to obtain the variety, without, however, succeeding in accomplishing our object. We were, therefore, highly gratified at the unexpected receipt, through Mr. Vanderkemp, not only of the seed of the California Raspberry, but also the dried berries of a variety from the island of Sitka, high up on the Pacific coast, and upward of nine hundred miles northwest of the mouth of the Columbia river. In an interesting letter to one of the committee, Mr. Frazier gives us the following information in regard to them :—"The dried Raspberries, in the package marked 'Sitka,' were brought from the Russian colony of that name on the northwest coast of America, by my friend Mr. James C. Ward, of San Francisco. He procured them while on a visit there, this last summer, and sent them to me with the hope that the plants might possibly be raised from them. I know nothing of them except that they are the Raspberry of the place. The seeds, in the other package, are those of a large buff-colored Raspberry, known in the country as the *Salmon Berry*. I found it growing, apparently wild, among nettles at Bodega, a small seaport about fifty miles northwest from San Francisco. Bodega is the port of a tract of country which was for a long time in the occupation of the Russians, who leased it for the purpose of supplying their colonies with grain. The Raspberries were found on the shore of the harbor, under the projection of high cliffs, which sheltered them from the northwest winds. As they were in the immediate vicinity of the company's warehouses, it is very possible that they had been planted there by the Russians, though I could not perceive any traces of cultivation. They grow, if I recollect aright, on the talus of the cliffs, and so completely mixed in with high nettles that I found it very difficult to procure them. The plants were from five to six feet in hight, and the berries of at least twice the size of the Antwerp, and between a buff and a salmon color, with a very delicate flavor, which reminded me of that of our carnation cherries." The berries from Sitka, though thoroughly dried, were quite large; we counted the seeds in two of them, and found sixty-eight in one, and seventy-two in the other.

Dr. Cleghorn states that after the burning or clearing of a forest in India, there invariably springs up a new set of plants, never known there before. We observe the same results in North America. India has always been covered with a population more or less civilized, and in vast numbers, while America has never been populated at all, comparatively. The singular results here or there excite a high degree of interest. All the theories given out are unsatisfactory. One says the birds do it! How long will the seeds of the trees live when dropped by birds on the surface, and exposed to the weather for one season? Do we find a sound seed of any tree which has lain one winter exposed to the weather? Are not almost all seeds very perishable? Who buys last year's nuts?

Seeds buried at a great depth are found to germinate. But who buried on the surface the seeds of the new forest which succeeds the old one in populous India? We throw out these hints in order to induce citizens to examine closely the growth of new plants and trees on the clearings of our country, and to have the kindness to send to the Club all authentic information relative to it, that we may compile something reliable upon this curious and interesting subject. We add one desire, that close observation be also made on old cultivated farms. What agency has there been at work to re-plant it—what lapse of time after it is deserted before it becomes replanted?—*Farmer's Club.*

A pine tree was cut lately on the farm of Samuel Emerson, at Black River, New Haven, which measured 14 feet in circumference at the butt, and 78 feet in length. It was probably over 2000 years old.

A few Botanical Names for the Memory.

(CONTINUED FROM FEBRUARY NUMBER.)

NASTURTION — TROPÆOLUM MAJUS; (a trophy.) NAT. FAM. TROPÆOLACEÆ, from this genus.

Well known from its pungent seed-pods; not to be confounded with *Nasturtium*, a native cruciferous genus of several well-known species; the *Cress* of our ponds and streams, in no way resembling *Tropæolum*.

OAK—QUERCUS; (from the Celtic, excellent tree.)

OAK—*Willow*; QUERCUS PHELLOS.
Laurel; ——— IMBRICARIA.
Live; ——— VIRENS.
Barren; ——— NIGRA; (Bl'k. Jack.)
Black; ——— TINCTORIA.
Scarlet; ——— COCCINEA.
Red; ——— RUBRA.
Spanish; ——— FALCATA.
Pin; ——— PALUSTRIS; (Swamp Spanish.)
Post; ——— OBTUSA.
White; ——— ALBA.
Swamp-white; QUERCUS BICOLOR.
Chestnut-white; ——— PRINUS.
Chestnut; ——— CASTANEA.
Rock-chestnut; ——— MONTANA.

NAT. FAM. CORYLACEÆ—as reduced by Lindley from the older name of the order, CUPULIFERÆ.

The common names vary in different localities of the country, but those selected are generally understood. Strange that a tree so valuable for beauty, shade, and duration, should receive so little attention from Amateurs and Arborists.

ONION—ALLIUM CEPA; (see Garlic.) NAT. FAM. LILIACEÆ, or Lily family.

Several varieties are cultivated for market.

OSAGE ORANGE — MACLURA AURANTIACA; (after WM. MACLURE.) NAT. FAM. URTICACEÆ, or Nettle family.

OYSTER PLANT—TRAGOPOGON PORRIFOLIUM; (*Tragos*, a goat, *pogon*, a beard.) NAT. FAM. COMPOSITÆ, or family of Compound flowers.

The Salsify of the Gardeners.

PARSLEY—PETROSELINUM SATIVUM; (*Petra*, a rock.) NAT. FAM. UMBELLIFERÆ, or family of Umbellate flowers.

PARSNEP—PASTINACA SATIVA; (*pastus*, a repast.) NAT. FAM. same as last.

There are several Gardeners' varieties, some of which are still unknown in our western markets.

PEA—PISUM SATIVA; (from the Latin.) NAT. FAM. LEGUMINOSÆ, or legume-bearing family.

Many favorite varieties of this delicate vegetable, are extensively grown.

PENNYROYAL—HEDEOMA PULEGIOIDES; (from the Greek, fragrance.) NAT. FAM. LABIATÆ, or family of Labiate flowers.

Quite common in fields; not the true Pennyroyal of European Botanists, which is *Mentha pulegium*.

PEPPERMINT — MENTHA PIPERITA; (classical.) NAT. FAM. LABIATÆ.

PERSIMMON—DIOSPYROS VIRGINIANA; (classical.) NAT. FAM. EBENACEÆ.

PINE — *Yellow*; PINUS VARIABILIS; (from the Celtic.)

PINE— *White*; PINUS STROBUS.
" *Pitch*; ——— PALUSTRIS; (southern.) NAT. FAM. PINEÆ, reduced from *Coniferæ*, or Cone-bearing family.

PIPSISSAWA — CHIMAPHILA UMBELLATA; (winter-leaf.) NAT. FAM. ERICACEÆ, or ERICA family.

PLUM—*Red*; PRUNUS AMERICANA; (from the Latin.)

PLUM—*Chicasa*; PRUNUS CHICASA.
" *Damson*; ——— DOMESTICA; (properly *Damascene*, or Damascus.) NAT. FAM. ROSACEÆ, or Rose family.

These kinds are well known—the last is the parent of the Gages, large purple, and other common varieties, to be found in our Orchards and Gardens.

POISON-IVY— RHUS TOXICODENDRON; (from the red color of the fruit.) NAT. FAM. ANACARDIACEÆ, from the typical genus.

The plant, in its most common form, is a climber, though not always so; leaflets in threes.

POKE — PHYTOLACCA DECANDRA. NAT. FAM. PHYTOLACCACEÆ, of which this plant is the type.

POPLAR — *Silver;* POPULUS ALBA; (tree of the people.)

POPLAR—*Cotton-wood;* POPULUS ANGULATA.
" *Balsam;* POPULUS BALSAMIFERA.
" *Shaking;* ——— TREMULOIDES; (Am. aspen.)
" *Lombardy;* POPULUS DILATATA.
NAT. FAM. SALICACEÆ, or Willow family.

POTATO—*Irish;* SOLANUM TUBEROSUM; (derivation obscure.) NAT. FAM. SOLANACEÆ, of which this genus is typical.

Native of Peru and Central America; many improved varieties are in use.

POTATO—*Sweet;* BATATAS EDULIS. (NAT. FAM. CONVOLVULACEÆ, or Convolvulus family.

Origin uncertain — supposed to have been a native of New Grenada.

PUMPKIN — CUCURBITA PEPO; (from the Celtic for gourd.) NAT. FAM. CUCURBITACEÆ, from this genus.

The original and proper English word and spelling, is *Pompion.*

QUINCE—CYDONIA VULGARIS; (name of a Cretian town.) NAT. FAM. ROSACEÆ, or Rose family.

RADISH — RAPHANUS SATIVUS; (from its early appearance.) NAT. FAM. CRUCIFERÆ, or family of Cruciform flowers.

The most esteemed kinds are included in the sub-genus *R. radicula,* of De Candolle.

RASPBERRY —*Garden;* RUBUS IDÆUS; (*Rubus,* red.)

RASPBERRY—*Wild red;* RUBUS STRIGOSUS:
" *Black;* ——OCCIDENTALUS; (Thimble-berry.) NAT. FAM. ROSACEÆ, or Rose family.

Of the first, or Antwerp, there are many Cultivators' varieties, though, perhaps, none really much better than the well-developed Mountain Raspberry, (*strigosus,*) of our own country.

RED-BUD—CERCIS CANADENSIS; (*Kercis,* a shuttle.) NAT. FAM. LEGUMINOSÆ.

RHUBARB—RHEUM RHAPONTICUM; (from the river where discovered.) NAT. FAM. POLYGONACEÆ, or Polygonum family.

RICE—ORYZA SATIVA; (the Greek name.) NAT. FAM. GRAMINEÆ, or Grass family.

RYE—SECALE CEREALE; (origin not clear.) NAT. FAM. same as last.

SAGE — SALVIA OFFICINALIS; (*Salvare,* to save.) NAT. FAM. LABIATÆ, or family of labiate flowers.

SASSAFRAS — SASSAFRAS OFFICINALE; (from the Spanish.) NAT. FAM. LAURACEÆ, or Laurel family.

The young leaves are used in pottage, and to make " Gumbo soup."

SUMMER SAVORY — SATUREYA HORTENSIS; (ARABIAN.) NAT. FAM. LABIATÆ.

SORREL, *Sheep;* RUMEX ACETOSELLA; (a spear, from the leaf.) NAT. FAM. POLYGONACEÆ.

This is the troublesome weed of the fields, not the three-leaved plant (*Oxalis*) of the gardens and meadows.

SPICE-WOOD—BENZOIN ODORIFERUM; (from the Arabic.) NAT. FAM. LAURACEÆ, same as sassafras.

SPINACH — SPINACIA OLERACEA; (from the prickly fruit.) NAT. FAM. CHENOPODIACEÆ, or Goosefoot family.

SQUASH — *Long-necked;* CUCURBITA VERRUCOSA; (Celtic for gourd.) NAT. FAM. same as the pumpkin.

STRAWBERRY—*Garden;* FRAGARIA VESCA; (*fragrans,* fragrant.)

STRAWBERRY — *Wild;* FRAGARIA VIRGINIANA. NAT. FAM. ROSACEÆ, or Rose family.

The garden varieties of the *F. vesca* are numerous and valuable. The Gardeners say the plant is diœcious; the Botanists say not so; the question will be discussed hereafter.

SUGAR-CANE — SACCHARUM OFFICINARUM; (*sacchar,* sugar.) NAT. FAM. GRAMINEÆ, or Grass family.

TANSY—TANACETUM VULGARE; (from the Greek.) NAT. FAM. COMPOSITÆ, or family of compound flowers.

THISTLE — *Common;* CIRSIUM LANCEOLATUM; (from the Greek.)

THISTLE—*Canada;* CIRSIUM ARVENSE.
NAT. FAM. same as last, though of another division.

Neither of these are native. The last is a most pernicious and outrageous nuisance.

THORN — *Cock-spur;* CRATÆGUS; (CRUS-GALLI.)

THORN—*Washington;* CRATÆGUS CORDATA.
NAT. FAM. ROSACEÆ.

Both of these are valued for hedging; the first named is the best, being much stronger than the Washington.

THORN-APPLE—DATURA STRAMONIUM; (from the Arabic.) NAT. FAM. SOLANACEÆ, or Potato family.

THYME — THYMUS VULGARIS; (*Thymos*, courage.) NAT. FAM. LABIATÆ.

TOMATO—LYCOPERSICUM ESCULENTUM; NAT. FAM. SOLANACEÆ, or Potato family.

TOBACCO — NICOTIANA TABACUM; (after JOHN NICOT.) NAT. FAM. same as last.

A pretty and naturally inoffensive plant, from which, however, a nauseous and disgusting drug is manufactured.

TULIP-TREE — LIRIODENDRON TULIPIFERA; (*Lirion*, lily, *dendron*, tree.) NAT. FAM. MAGNOLIACEÆ, or Magnolia family.

TURNEP — *Common;* BRASSICA RAPA; (the name of the Cabbage.)

TURNEP — *Swedish;* BRASSICA CAMPESTRIS; (*ruta-baga.*) NAT. FAM. CRUCIFERÆ, or family of cruciform flowers.

WALNUT — *Black;* JUGLANS NIGRA; (Nut (*glans*) of Jupiter.)

WALNUT— *White;* JUGLANS CINEREA; (butternut.) NAT. FAM. JUGLANDACEÆ, from this genus.

WHEAT — TRITICUM SATIVUM; (*Tritum*, ground, or powdered.) NAT. FAM. GRAMINEÆ, or Grass family.

WILLOW — *White;* SALIX ALBA; (from its growing near water.)

WILLOW— *Weeping;* SALIX BABYLONICA.
" *Osier;* —— VIMINALIS.

NAT. FAM. SALICACEÆ, from this genus.

There are many more species, but they are difficult of definition, and not well understood. Neither of these named are native; the last might be cultivated with success and profit, for basket-making.

WORMWOOD—ARTEMISIA ABSINTHIUM; (classical.) NAT. FAM. COMPOSITÆ.

J. W. W.

California Plants.

CALIFORNIA SASSAFRAS. — The opinion seems to be prevalent that no sassafras is found in California. This is probably true, with regard to the more common kinds so abundant in the older states.

An interesting species of the *Laurus regia*, abounds in various sections of this State. It is a very handsome tree, with dark evergreen foliage; and is known as the "*Laurel Tree.*" It may now be seen in full bloom (this Jan. 1st.). The flowers are in little clustered heads, on stalks growing out from the fork of the leaves and about one half their length; generally eight in a bunch; of a pale-greenish yellow color — 9 stamens to 1 central pistil; the leaves are long lance-shaped, slightly oval—margin, smooth, texture netted and thin, dark green above, lighter underneath; (fruit not seen). In favorable localities its growth is rapid but short-lived, attaining the hight of 30 to 50 feet by 2 or 3 in diameter. In MCDONALD'S yard, situated at the head of Barreas Valley, above Napa, is the largest ever seen by the writer. This was some 2½ feet in diameter. It abounds, in varying size, along the margins of our little valley rivulets, and springy "*dry creeks,*" as they are called.

The tree may be scented at some distance, and exhales an odor so strong as to be quite overpowering to some persons, causing sickness and headache, if even "*camped*" under at night, during the warm season. Named by some authors, *L. oro-daphne.*

The leaves are used, in California, for culinary purposes, in the celebrated French Creole *gumbo* dishes; being mucilaginous with a very strong pungent spicy flavor. If chewed in any quantity the volatile oil fumes into the nostrils so strong as to be painful, bringing tears to the eyes as horse-radish and mustard; but more persistently biting the tongue like prickly ash.

The timber is equal to plain mahogany, and for cabinet work must prove useful for trunks, clothes-presses, bureaus, etc., equaling the camphor-wood trunks imported from China, (which is of the same genus) alike affording security against moths, and other insects.

Medicinally, it is a warm aromatic stimulant, and would furnish an excellent ingredient for flavoring *small beer* and other beverages. A. KELLOGG.

San Francisco, Cal.

THE winter has been severe in all parts of Europe. In Belgium the snow lay some feet deep on the railways, and troops were employed in clearing the track. In Madrid the ice was thick. In the north of Europe, the winter was severe. The Baltic was packed with floating ice.

CORRESPONDENCE.

BOTANICAL GOSSIP.

The following letter is from a valued friend—a true lover of nature, and who has performed long journeys, some of them as a pedestrian, for the better opportunity of observing plants in their native habitats, his favorite pursuit being the study of Botany. A visit to his nursery and multitudinous collection of living plants, including an infinite variety of natives and foreigners, was a source of infinite pleasure to me, one day last August, and it would almost repay a pilgrimage of greater distance, for any devotee of the science of Botany; Mr. Hanson, of the Philadelphia Florist, who can reach Plymouth in an hour, will find the lore and loves of my old friend, Alan, well worth the little effort required.

I do not think the *Vitis riparia*, referred to in my article in the January number, can possibly be the same as the *Cordata*. We find them both barren and fertile. I have not known of any beneficial effects having been observed by our vignerons as resulting from the vicinity of a staminate vine, and should need further observation before asserting that the Catawba and the sweet-scented staminate vines blossomed together; my impression is that they do not bloom simultaneously; if they did, it would be very rational to conclude that a more complete impregnation should ensue, as the fragrance would attract the insects, and they would more thoroughly distribute the pollen. J. A. W.

John A. Warder:

Respected Friend—I received the first number of the new Series of the Review to-day (got up in fine style), which was very welcome. * * * * * * The heading of "Rare plants," at page 33, attracted my notice, and upon examining, I find *Pinus lanceolata* mentioned, and after examining pages of synonyms, I find that the *Cunninghamia sinensis*, sometimes known as the *C. lanceolata*, has been called *Pinus lanceolata*. It is a beautiful plant of rapid growth. I inclose a specimen—but I very much doubt whether it will be hardy here. Prince's description otherwise suits this plant, but the appearance is so different from the pine, that most persons would be surprised to receive it as such. I have a single plant, got last year from Europe, it grows rapidly. I suppose it has been grown from a cutting, as it has the appearance of a side-branch; it was planted in open ground, but as I desired to become acquainted with it, I took it in this fall, so that I might keep it another season, after which I purpose to let it bide the pelting of the pitiless storm.

I observe in the first article in the Review a description of a Grapevine which entirely agrees with the species which we here regard as *cordifolia*, but which is there named *riparia*. We cultivate a barren grapevine for the odor of its staminate flowers; my recollection is that some years ago, upon examining it with such descriptions as I had, I came to the conclusion that it was the *riparia*—sometimes I have noticed it in catalogues marked as *odoratissima*. I do not know that the fruit-bearing plant is in our vicinity. I observe that Elliot, who copies the specific description of *riparia* from Michaux verbatim, adds, "Flowers very fragrant;" Purch copies this, and in his additional description adds, "it is said to surpass in flavor all our native grapes," but can speak of it only from report. If your plant or vine is the sweet-scented species, I shall be glad to receive a fruit-bearing vine. * * * I recollect that some person whom I regarded as observant (but whose name I do not now remember) stated to me that his grapes (Isabella or Catawba) fruited more abundantly after having this flowering sweet-scented male grape among them. Can this result from that cause?

I observe from the ad interim report of the Penn. Hort. Society, that they have also received seeds of the Oregon Raspberry, or Salmon Berry; it is recommended highly as regards size and flavor. The circumstance that the *Rubus Nutkanus* (being, as I judge, the western form of the *Rubus odoratus*) has been long known on the N. W. coast, leads to the suspicion or fear that the Salmon berry may be the *Nutkanus*.

The *odoratus* is abundant in some localities near here, and I have observed occasionally fruit of large size, eatable, but not pleasant. I had it many years in my garden, but it did not fruit there. I have only seen it on the northern sides of hills along Schuylkill, Wissahickon, and such-like places, affording

shade and moisture. I moved specimens to a shady, dry wood, on north side of hill near my house, but it does not seed there.

Respectfully thy friend,

ALAN W. CORSON.

Wild Flowers for the Garden;

NATIVES OF THE VALLEY OF THE OHIO.

EDS. BOT. MAG. :—Few things are more conducive to the happiness of domestic life, than a well selected, and nicely arranged Flower Garden. The sight of richly colored, and beautifully formed articles, always affords pleasure to the mind; as mere objects of beauty, nothing affords a richer enjoyment, than flowers. While many things in nature are evidently made for the benefit of all, both rational and irrational beings, such as the grasses, grains, and fruits, flowers seem designed, by the all-wise and benevolent Creator, for the especial delight of man. If the great and good God, has seen fit to decorate his footstool, with the most beautiful forms, tinted with all the rich colors of the rainbow, in every variety of combination, merely to gratify the eye of man, why should not he testify his thankfulness, by cultivating and cherishing flowers, as one of His richest gifts, instead of asking, with a parsimonious spirit, of what use are flowers? Can they be eaten? As if nothing beautiful was valuable, unless it could be devoured; such persons should be reminded, that God has given us two eyes, and but one mouth; thus indicating that the sense of seeing is doubly important to that of tasting; and silently, but pointedly, rebuking that inordinate animal propensity, so common to the larger portion of mankind.

It is a favorable sign of the progress of refinement, that there is within a few years, a decided advance in a cultivated taste for flowers. It needs cultivation, like that of music and painting—a nice taste for flowers, is not confined to the rich in cities, or to the aristocracy of the country; it is found with the poor and lowly, who only need the means, to enable them to display both refinement and delicacy in their choice of varieties. Those who are blessed with this love of flowers—and it is really a blessing, far more compensating than the love of fine dress, and rich ornaments—and are the owners of a plat of ground, be it ever so small, can gratify their taste, by simply selecting from the woodlands, and hill-sides, as choice flowering plants, as brilliant in colors, and beautiful in form, as any that grow in "Araby the Blest." Our land and climate is favored with a variety of indigenous flowering plants and shrubs; some of which are equal to the most highly prized foreign favorites; and although common to us, because we have been familiar with them from childhood, and so, lightly esteemed, yet are, in fact, more beautiful than many rare and costly exotics—numbers of them being admired, and greatly valued in foreign lands; thus showing, that they need only to be regarded as rare and new, to be received into high favor.

A list and description of a few of our Native Plants, such as are common in the Valley of the Ohio, and that I have myself grown for a number of years, in my garden, will be given, with the expectation and belief that their beauty will fully reward the Cultivator for the trouble he may be at to rear them.

HEPATICA TRILOBA, OR LIVERWORT.

NAT. ORDER, *Ranunculaceæ.*

General Characters. — Involucre three-leaved, resembling a calyx; sepals, 6 to 9, purplish, or nearly white; petals, none; roots, perennial; leaves, all radical, three-lobed, green, mottled with purple on the upper surface; flower-scapes, numerous, hairy, each terminating in a single flower. It belongs to the same family with the wind-flower, or anemone, whose blossom it much resembles.

This humble and retiring plant, like the violet, too modest for the public gaze, stands at the head of my favorite native flowers, not only for the exceeding beauty of the foliage, but the wonderful variety of tints displayed in its flowers, as well as for its early appearance, being, in this respect, a rival to the English crocus, and snow-drop; appearing on warm hill-side exposures, early in March, and often peeping up timidly, from beneath the snow, as if fearful of intruding on the retreating footsteps of Winter. Its flowers are sometimes double, and by culti-

vation would, doubtless, become permanently so; but I do not think it would improve their natural, delicate beauty, so graceful and becoming in their original habitat. In tints, they embrace several shades, from flesh-color, up to pure white—a rich deep pink, and numerous tones of blue, from very dark, to pale azure. The plant prefers a northern exposure, on rich hill-sides, where the soil is composed of leaf mold, and sandy loam, intimately combined. My own plantation is on the north side of a board fence, in a soil of this character, and the flowers are fully expanded, when the sun falls upon them, about one o'clock, P. M. The petals close toward evening, as the sun declines. In an eastern exposure, the bloom opens in the morning; in a southern one, the heat of summer is not congenial to its habits; though the position would, doubtless, please it much in the early spring. A large portion of its rich, dark foliage, is killed in hard winters, but as soon as the flowers fall, a luxuriant crop of leaves, of a pale green, supplies their place. A light dressing of rotten leaves, placed over the plants, in autumn, at the setting in of winter, protects both foliage and roots; aiding the early spring growth of the flowers. The proper season for selecting the plants, is in the month of March, when the blossoms are out; as you can then take such as pleases your taste, having the richest shades and harmony of colors. With a transplanting trowel, sunk deeply beneath the roots, in the soft earth, you easily transfer them to your basket—when, without delay, they should be planted out in the nicely prepared bed, at intervals of ten or twelve inches, and be well watered over the leaves and roots. If, from this amply filled bed, you do not derive both pleasure and gratification, for many coming years, I shall be greatly disappointed. S. P. W.

Marietta, O., March, 1854.

Flowering of our Native Plants.

EDITORS REV. AND BOT. MAG.—In complying with your request, to furnish you with a List of some of the more beautiful Plants, native or naturalized, in this vicinity, which flower in each month, it will be necessary to make a few preliminary observations. With seasons variable as ours, it is impossible to state accurately the time at which a plant blossoms; for at the same period, in different years, there is often a variation of a month or more, in the progress of vegetation. The same *Acer dasycarpum* was in bloom in successive years, on March 4th, Feb. 26th, Feb. 12th, April 7th, and Feb. 29th; during the same years, the first of the *Erigenia bulbosa* appeared at various dates, from Feb. 10th to April 7th. As the season advances, and there is less danger of weather cold enough to retard their growth, flowers open with more regularity.

The soil, exposure, the age and strength of the plants, and in annuals the more or less favorable spots in which the seeds have fallen, produce further irregularities.

In this and the succeeding numbers of this series, the plants will be placed in the earliest month in which the writer has known them to be in bloom; but from the above-mentioned causes, and because one person cannot have seen the first appearance in flower of all the species embraced in a circuit of fourteen miles diameter, some of them may perhaps be found sooner than the month in which they are recorded. They may nearly all be found in the succeeding; some in the second month after, and others, even later, according to the variety of their locality, and the period of their florescence.

Some years have passed since the observations and collections, from which this calendar is taken, were made; and, as during that time the rapid increase in population of the surrounding country, has been very destructive to our Flora, some of the species may now be extinct in this vicinity.

Most of the plants which flower in March, thrive well under cultivation, and at a season when few exotics are open, make pretty additions to the garden. L.

Cincinnati, Feb. '54.

PLANTS OPEN IN MARCH.

*Acer dasycarpum......	Silver Maple.
" rubrum..........	Red Maple.
*Cardamine rotundifolia.	Water-cress.
" rhomboidea.	Bitter-cress.
Claytonia Virginica....	Spring Beauty.
Corydalis aurea.......	Golden Corydalis

Dentaria laciniata......	Tooth-wort.
Dicentra cucullaria......	Dutchman's Breeches.
" Canadensis ...	Squirrel Corn.
Draba verna............	Whitlow Grass.
*Erigenia bulbosa.......	Erigenia.
Erythronium albidum..	White dog tooth Violet.
Hepatica triloba........	Liver-leaf.
Isopyrum biternatum...	Isopyrum.
Jeffersonia diphylla....	Rheumatism-root.
Leontodon taraxicum...	Dandelion.
Mertensia Virginica....	Lung-wort.
*Obolaria Virginica.....	Penny-wort.
Phlox divaricata........	Branching Phlox.
Polemonium reptans...	Greek Valerian.
Populus monilifera. ...	Cotton Wood.
Saxifraga Virginica....	Early Saxifrage.
Sanguinaria Canadensis.	Blood-root.
Stylophorum diphyllum	Yellow Poppy.
Thalictrum anemonoides	Rue Anemone.
" dioicum....	Early Meadow Rue.
*Ulmus Americana.....	White Elm.
" fulva..........	Slippery Elm.
*Uvularia grandiflora...	Large Bell-wort.
Viola cucullata........	Hood-leaved Violet.

*Sometimes flowers in February.

Cunninghamia Lanceolata.

Our Correspondent, referring to Mr. Prince's short list of "New Plants," in our January number, says he found difficulty in recognizing his "Pinus Lanceolata," and suggests that Cunninghamia may be intended. Our Correspondent is right. Mr. Prince's plant must be

Cunninghamia Lanceolata; Brown.
Nat. Order *Coniferæ*.
Cunninghamia Sinensis, Richard;
Pinus Lanceolata, Lambert.

Generic Characters. — Male aments ovate, scales densely imbricated, pointed; anthers three, pendent, one-celled. Female aments sub-ovate; scales imbricated; external bracteoles closely adnate; internal, three-flowered; flowers inverted. Cones, ovate, with coriaceous, reddish, hard, somewhat triangular scales; minutely-toothed, and inclosing the denticulate floriferous scale; immediately beneath which are the three obovate, compressed pendent pericarps, with alate margins. Seeds albuminous, inclosing a nearly cylindrical, erect, dicotyledonous embryo, with obtuse cotyledons.

Description. — A tree of variable size, with opposite cylindrical branches, and numerous solitary, linear-lanceolate, sessile, rigid, acuminate leaves, minutely serrate; upper surface dark, shining, green, with two conspicuous longitudinal lines; under surface, glaucous. The male catkins are at the extremity of the younger branches, surrounded at the base by several green, obtuse, imbricated scales; anthers pendent, oval, opening with an internal longitudinal fissure; pollen, yellow, globular.

This tree was introduced into England from China in 1804. It is a rare and beautiful plant, discovered by Mr. James Cunningham, whose name it bears. It resembles the *Araucaria imbricata*. The term *new*, as applied to the plant, can only refer to its recent introduction to general notice in this country, having been known in England for nearly fifty years. Of its adaptation, as an ornamental tree, to our Northern Climate, we cannot speak advisedly. Mr. Price, however, regards it as "hardy." J. W. W.

Achillea Rosea.

This, the rose-colored Milfoil, is so called by Waldstein and Kitabel, two Botanical writers upon Hungarian plants, of which country this beautiful plant is a native.

This plant is closely allied to our indigenous species, called *A. millefolium*, and more especially to its red variety, but it is altogether a larger growing plant, and its flowers much larger, and of a deeper dark rose-color. These points render it a most desirable plant for our flower-borders. Its leaves are all bi or tripinnatifid, or many and finely-cut. Its flowers are produced in compact spreading heads in June, and more or less to November. Of course the decaying flower-stems should at all times be cut away, as soon as their bloom is over, and the successional stems neatly tied up. This plant generally rises from two to three feet in hight, therefore making a good plant for a second row in the bed or border, or a back or center row, where the beds are small, or the borders narrow, and suitable for dwarfish plants.

Any good garden soil suits this plant, but as it is rather inclined to spread about at the root, particularly in light, rich soils; it becomes necessary, in order to keep compact bunches in the flower borders, to replant either every year, or every two years at farthest. This should be done during fine, open weather, in the spring months. At the same time increase may be made of the plants to any extent that may be required. This plant was introduced to this country in the year 1803.—*Cott. Gard.* T. W.

Hybridizing.—Saving Pollen.

MR. BEATON, one of the leaders of that excellent and practical journal, the Cottage Gardener, when considering the subject of Hybridizing plants, said, many years ago, that he believed the pollen of Rhododendrons might be gathered on the Himmahlayas, and sent over to fertilize the varieties in cultivation, so as to produce new hybrids. He appears to retain the same opinion, and makes some very sensible suggestions which will be read with great interest, not merely by the practical gardener who is pursuing this higher department of his art, but also by the student of vegetable physiology.—*Eds.*

We have numerous accounts on record of seeds having vegetated after long periods of rest, away from atmospheric changes, after being boiled for different lengths of time, and after resisting the pestilential influence of sewer and soil-drains for many years. Plants have been raised from seeds which ripened in the *herbarium* of the botanist, and remained there for a lifetime; and there is hardly any other way of transmitting the seeds of Ferns from one country to another than that of cutting off specimens, or pieces of the Fern-leaves, before the seeds are quite ripe, to dry them, and then pack them where no moisture will reach them, and they are safe for many years, the dust-like seeds of Ferns being even more tenacious of life than the larger kinds of seeds; but to retain its power, it must be in the seed-vessels, and on the leaf which bore them, and the leaf must be gathered and dried like hay, before the seed-vessels are ripe enough to open and discharge the seeds.

In the same way, and under similar circumstances, we have presumptive evidence that pollen may be gathered, and harvested so as to retain its subtle power of impregnation for any definite period, or, at least, as long as Fern-seeds retain their powers to vegetate. This is a new field of inquiry into which we would lead the young gardener and the amateur.

The improvement of races of plants is not destined to stand still more than other improvements, and nothing would tend more to the speedy termination of an experiment than that we had control over the supply of pollen, so that we might use it when and where it was most convenient to ourselves. The power which we now acknowledge in conducting experiments, extends no further than getting the two parents into flower at the same time, or within short periods of each other. In anything beyond that, we are, at present, powerless; but we see no just reason why we should be so confined with pollen more than with Fern-seeds; preserve them, or say, at once harvest them, exactly on the same principle, and the one will keep just as long as the other. * * * We have had reports of failures in trying to keep or harvest pollen from Australia, India, North America, and from many people in this country, but from none of them have we heard one word about the process of ripening and drying pollen; therefore, we shall assume that no one has yet mastered the seeming difficulty of harvesting pollen for future use, and that the failures recorded were not due to the impracticability of the thing, but rather to the want of a knowledge of how pollen ought to be harvested, and that want is what we now propose to supply. Pollen, fifty years old, in a herbarium, was found, under a microscope, to yield to moisture exactly as fresh-gathered pollen would do—the little bags distending till they burst; *the matter discharged differed in no way from that from a recent anther.* The seeds of Ferns have been brushed off from a specimen dried for, and kept in, the herbarium for more than fifty years, and produced plants. Who can describe the difference in size and weight between a pollen-grain and a Fern-seed; and who can believe it possible that the seed would keep fifty years, and that the pollen-grain would not, under similar circumstances?

The failures in saving pollen arose entirely from want of thought in the harvest-men who undertook the experiment; they allowed the anthers to become ripe before they gathered them, or so near to ripeness that they opened during the process of drying. Now, if we allow a Fern-seed to break its case and get into the open air, or the anther is allowed to open its valves, as the case may be, we might just as well attempt to lock up electricity as to secure the Fern-seed, or the pollen-grain, from destruction. The case of the Fernseed must never open until it is rent asunder by the swelling of the seed itself, under the bell-glass of the gardener, on the damp sand. The anther must be equally guarded from every influence that would excite it to open until it is wanted, or rather its contents, for the stigma of the recently opened flower. All that we have actually proved on the subject is this, that if we extracted anthers and stamens long before the anthers were ripe, that the pollen in them would ripen, and be in use, and fit to cross, after the lapse of six months; and that pollen gathered when ripe and flying out of the anthers, though kept with the greatest care, would not fertilize the stigma of the parent plant at the end of a month. We believe the driest atmosphere we can

keep in our rooms and drawers is far too moist for the preservation of pollen for any length of time after being actually exposed to it; and we also believe that an anther would keep as long as a piece of bladder under the same influences, and that it is as impervious to moisture as the bladder, and, therefore, as capable of preserving pollen as is the seed-vessel of the Fern in retaining the vitality of the seed—a fact that no one now questions.

If the flower of the *Geranium* is picked off as soon as it opens, although the anthers may appear to be only half ripe, there is sufficient moisture in the flower to feed the anthers and cause them to burst in two or three days. Therefore, if it was intended to dry that pollen for preserving, it could not be done, as no method could be adopted to save it if once it is in contact with the air; that flower was too far gone to be harvested for pollen, and it would be much about the same with nine flowers out of ten from other plants.

Then, it follows, that when we wish to make dry specimens of flowers, with a view to save the pollen, we must gather them a short time before the flower opens; or when there is more than one flower on a stalk, and they are known to open in succession, it will be as well to let the first of them just open before you cut the stalk, and let it take its chance; if we can get it and the anthers dried in such a manner as that the latter do not burst, so far so good; but, if not, the loss of the former flower will not be much, and we can reckon on some, or all the rest, to ripen the pollen without reaching that point of ripeness when the anther should burst.

Here we are met by a wise provision of nature, which is familiar to any one who has been in the habit of dissecting flowers, and which greatly assists us in this work. The anther is the first part of a flower which comes to its full size, the stamens lengthen out very gradually, the petals no less so, and the stigma is hardly ever up to its full size so soon as the other parts; but the anthers, on the contrary, are of full size when the flower is only in the bud. In some plants they are full-grown ten days before the flower opens. *Wheat*, for instance, is impregnated by its own pollen before the top of the ear issues from the sheath, and before stamens come into existence, or nearly so; therefore, it is impossible that one kind of wheat should naturally fertilize another wheat in the field. The moment the wheat pollen is shed, the stamens begin to lengthen, carrying up the empty bags on their summits, till, at last, they push them right into the open air; then the farmers believe the plant is in blossom.

We have met with a hundred instances in which the anthers were in full size, and all but sessile; that is, without a sign of stamen below, while the flower is a mere bud. To cut a full-sized anther, at that stage of the flower, would give one no signs that anything like dry dust should ever be formed by it. It is a solid mass of tissue, apparently like any other soft portion of the plant. Now, supposing that one of these flowers were cut off ten days before the pollen would be ripe, and that it was dried very slowly, after the manner of specimens for the herbarium, if there were sufficient moisture in the stalk and surrounding parts to keep the anthers from shriveling, there is no question about the pollen ripening during the process of drying. The full-sized anther requires no more room when the flower is quite opened than it occupied some days before; hence, the greater facility of getting the pollen well-ripened after the flower is cut, without causing the anthers to burst open.

Suppose, now, that we have a truss of *Geranium* flowers well up in the bud, dried, and ready for the herbarium, with the pollen ripe, but the anthers not likely to burst or open; is there anything in reason, or philosophy, which can contradict our surmise, that that pollen may be kept in that state for many years, and be as good when the anther was cut as it was the first day? We think not.

The next question is about the best way to dry the flowers; and here it must branch into wide-spread diversities. Some flowers, with thick substance in the parts, say a *Gloxinia* flower, will require to be dried as fast as it can safely be done, or the great store of sap will, assuredly, run the anther to the bursting point before all is sufficiently dried. Another, say some slender *Heath* flower, with hardly any substance in it, or round about it, in the leaves or the shoots, must be dried as slowly as possible, in order to give time to the full development of the pollen; and all intermediate flowers must be dealt with according to the best of our judgment, until by practice, we come to understand more of the subject that any one can lay claim to at present. What we have to bear in mind, is, that if the anther once opens there is no more safety to the pollen; that the juice in the parts is sufficient to ripen the pollen after the flower-buds and flower-stalks are separated from the plant; and that it is not safe to trust to the anthers getting too near the ripe stage before the flowers are cut off, lest they go on to bursting before the specimen is dried. If all this is kept in view, the rest, about the length of time, and best ways of drying, will easily be found out in the course of practice.

We know of nothing now to be ascer-

tained, from the whole circle of botany and gardening, of so much importance to mankind, as the affirmative of all these suggestions; for, let us be understood only as suggesting the probability of the subject being within our reach.

The way they dry botanical specimens for the herbarium seems as good as any for drying pollen specimens. The first day or two the specimens are spread out, and held between sheets of blotting-paper, in a book, the sheets, or the position of the specimens being often changed, so that the blotting-paper does not get wet or damp. After a certain degree of drying, some pressure is applied, but this we must not indulge in too far for pollen-drying; the least weight might squeeze a ripe anther to the bursting point, when all would be lost. When the process is complete, the flower-buds, the flower-stalk, and the branch, if any, ought to look as natural and free from stains as an ear of corn, or a grass-stalk from the hay-rick. There is hardly a plant known, of which a dried specimen is not kept by some one. Weeds are kept with as much zeal as the most gaudy flowers, and new names are now often determined by old specimens that have been preserved hundreds of years. It was from an old flower thus dried that we first took up the idea of saving pollen; on the application of moisture to the old dried pollen it exhibited all the symptoms of vitality, under a lens, that fresh pollen from the garden could do; and knowing the vast stride in the improvement of races, which pollen ready at all seasons would give us, we are anxious to press candidates into the field.

Suppose, again, that we have dried pollen at hand, and that fresh flowers are ready for dusting — take the dried flower, and, with the point of a pin, tear the anther open, then stick the pin through it, and carry it on the point of the pin to the stigma to be fertilized, and draw it two or three times across it, then give your hand a gentle touch to dust off the remaining part of the pollen, and the work is done. The plant may require to be kept out of the draught for some hours, as the old pollen may have to lie longer on the stigma than fresh pollen, before it effects the mysterious process. Who that has a *Japan Lily* now in bloom, that would not wish to have a ripe anther of some spring or summer lily to try his first experiment in crossing? Autumn and spring *Crocuses*, if they could thus be crossed, would give us flowers for the whole winter, and so on through all the families in the catalogue.

There is one more branch of this subject, a most simple one, and yet it seems to have been a stumbling-block to every cross-breeder, [hybridizer] here and abroad, who has recorded his exploits. Notwithstanding the utmost precaution in guarding against the access of its own pollen into a flower—and even going so far as forcing two plants in the spring, in order to make more sure of a cross — they tell us, one after the other, that the produce was in nowise different from a natural seedling. We have no record, however, from any one, of how he destroyed the natural pollen, more than we have from those who failed to harvest pollen, how they managed, or rather mismanaged the experiment; therefore, we must presume that they merely extracted the anthers, the moment the flower opened, or just the day previous to the opening, and let them (the anthers) *take their chance*. Here is just where the mistake lies—the anther, or rather, the pollen, is all but ripe in any flower when that flower is fit to open—or, if the extraction is done some days previous, we have seen that the juice in the stamen, or even in the anther itself, may be sufficient to ripen the pollen after the anthers are cut off; and we know the least breath of air will disperse ripe pollen in clouds like dust.

Suppose, then, that you had extracted all the anthers from a *Geranium* flower this morning, and let them drop down on the surface of the pot or border, that was not the least security against that very pollen entering the same flower from which it was extracted, and neutralizing the effect of another pollen; the air, or wind, the bees and ants, had the same power, and the insects the same will, to disperse the pollen from the fallen anthers, as they had when the pollen was allowed to ripen side by side with the stigma. We have often seen an ant carry a discarded anther a long distance in its mouth, up and down, through all parts of a plant, across the stage, and off to its nest. We never did see an insect carry up the pollen from a fallen anther back to the flower, and actually dust it on its sister stigma; but we see nothing to prevent the possibility of access in some such way, unless the anthers are actually squeezed to death between the finger and thumb the moment they are cut out. One can never rely on success if a single anther has dropped where we cannot find it, so as to have it destroyed on the instant. The fact of letting a single anther escape destruction accounts, plainly enough, for the failure of any single experiment.

A Hale Old Tree.—Capt. Solomon Marsh, of Litchfield, Ct., has on his premises an apple tree which measures fourteen feet around the trunk, and yielded the past season, 20 bushels of good fruit. Previous to 1835, it yielded about *one hundred bushels* per year! The tree was brought from Hartford, by the first settlers of Litchfield, and has borne delicious fruit one *hundred and thirty years!—Litch. Rep.*

The Hyacinth—Pot Culture.

As the lovely spring opens upon us with its lovely day stars, expanding not only in the sunny and nurtured parterres, but also in many a sheltered nook and cove in the wild wood and mountain side, we sometimes wish that we could prolong the delights of this precious period of the year. With proper forethought and some simple appliances this may readily be accomplished, not by extending the spring into the summer, which, indeed has pleasures and treasures of its own, but by anticipating the vernal kalends. Certain plants are so pliant to the will of man, and the forces he brings to operate upon them, that they may be compelled to culminate to the acme of their glory in advance of the period assigned to them by nature. This treatment constitutes what we call *forcing*, whether it be applied to fruits, flowers, or vegetables.

Among the flowers which are eagerly sought at this season of the year, and admired for their beauty and fragrance, few are more desirable than the Hyacinth, and few attract more attention in the flower market of our city. Still, some persons may wish to anticipate the natural period of blooming, yet further, and may prefer pot-culture to the bulb-glasses, that are often a miserable failure and disappointment. Our friends in the country, who cannot have access to the greenhouses that cluster about a metropolis, will also wish to know how they too may enjoy the delights of a succession of these beautiful flowers, to cheer their windows and perfume their parlors. Therefore, the following practical remarks from Mr. Appleby, of the Cottage Gardener, are transferred, with a passing remark that four inch pots will answer very well, and that in our climate the exposure as recommended, in the garden, in the open air, will not be likely to bring their flowers very early, and the freezing and thawing will spoil the pots if exposed to severe weather, which will not, however, injure the bulbs. We prefer to pot the plants, and then bury them in a box, filling the spaces about them with fresh, moist earth, and covering them five or six inches deep. The box may be put into the cellar, or any dark place where it may be kept moderately warm and sufficiently damp, until good roots are formed, and fine strong shoots of leaves are produced. The pots may then be removed and brought gradually to the light and air, until the bright green hue is established in the foliage, when the buds will be rapidly produced. A very good treatment is to place the pots in a cold frame, with the glass shaded partially. To produce a succession of flowers, from Christmas to the end of March, which is as long as any reasonable lover of Hyacinths should demand their continuance, a little management will be required, some of the boxes of buried pots should be placed in a warmer position, and their contents should be successively brought out into the light, while other boxes may be left out of doors all winter to freeze and thaw with the changes of the season, or they may be shaded so as to remain frozen most of the time, and thus be retarded. J. A. W.

Soil. — This should be rich and not too light. I last year had a fine bloom potted in good, sound loam, of rather a strong texture, mixed with about one-fourth of horse-dropping gathered from the roads in my neighborhood. I find this dung very excellent for potting purposes for various plants, such as Geraniums, Cinerarias, Chrysanthemums, and even the finer kinds of Florists' flowers, such as Auriculas and Polyanthuses. No doubt, the sand and debris of the stones used for the road are useful ingredients in the compost. If, however, this article cannot be procured, well-rotted cowdung will be a good substitute, provided the compost has a liberal addition of sharp sand added to it.

Size of Pots. — The kind denominated "Hyacinth pots," which are at least one-third deeper than the ordinary ones, are the best for these bulbs, as, also, for the *Polyanthus Narcissus*; but they are not absolutely necessary, because the flowers are formed in the bulb the year previously. When one bulb only is put into a pot, I use the size called large 48's, which are nearly five inches in diameter at the top, and for two bulbs I use the small 32's, which are six inches in diameter. In these sizes I have had very splendid blooms. No doubt, three, or even five, bulbs might be planted, with a good effect, in pots large enough to contain them, if they are to bloom in a greenhouse or a conservatory.

Last year I had some large, ornamental vases filled with the following bulbs:—In the center, three *Polyanthus Narcissus*; next, five *Hyacinths*; then, about a dozen yellow, white, and blue *Crocuses*, and, lastly, a border of *Snowdrops*. These all flowered well, and were very much admired. They stood on the lawn, and were protected whenever there was any frost by mats. For a large conservatory these vases would have been very ornamental.

Potting.—Whatever kind of pots are used they must be well drained. I find an oyster-shell or two very useful to cover the holes

at the bottom of the pots, and I think they afford a considerable amount of nutriment to the plants; over these place a thin layer of broken potsherds. Then, upon this drainage place a thin covering of very fibrous turf, broken into pieces. I have used this with great success in a green state; the decaying turf constantly gave out nourishment to the plants. Then put a layer of the compost, and press it down very firmly, only take care that it is in a proper state, neither too wet nor too dry. Keep adding more soil, and pressing it down till the pots are full enough to receive the bulbs. This pressing the soil so hard is to prevent the roots running down too quickly to the bottom of the pot, and thus, as it were, compelling them to draw the nourishment out of the soil as they descend. This is a very important point, and should be carefully attended to. When the bulb is placed in the pot upon this firm bed of soil, the top should be about a quarter of an inch below the level of the pot-rim; then fill in more soil around it, pressing it also firm and close to the bulb. If this be not properly done, when the roots begin to push they will lift the bulb out of its place, and these roots will be liable to be broken if the bulb is carelessly thrust forcibly down to its proper position. When this (the rising of the bulb) does happen, the bulb should be carefully lifted up, and a little soil taken out to make room for the roots, the bulb replaced gently, and the soil pressed again firmly around it. Some prefer leaving the very point of the bulb just out of the soil, but I prefer covering it entirely, about the eighth of an inch, there is not then so much danger of the bulb being lifted out of its place when the first roots are forming. The season for potting these bulbs is the last week of September, or the first week in October, for early blooms; but they may be potted even to the end of November, if not forced too hard at first.

As soon as the whole are potted, a position must be sought to place them in till they push forth roots and begin to show the buds. A bed, four feet wide, in an open place in the garden, will be suitable. If the situation is dry, the soil may be excavated about four inches deep, and a layer of coal-ashes spread over the bottom, to keep worms out of the pots. If it is desired to preserve their names, they should be written upon labels of wood, painted with white lead, and written upon with a black lead pencil, or, what is better, on zinc labels, with prepared ink; then place the pots on the bed, and cover them over with spent tan-bark, or coal-ashes, about two inches above the pots. Here they may remain till they are required, either for forcing into flower, or till the spring.

Take a portion of them into a warm pit, heated by some means, such as hot-water, dung, or tan-bark, to bring them into flower early. Let the forcing process be gentle, especially for the first three or four weeks, when it may be increased five or ten degrees. Begin, say with 50°, and then increase it to 55° or 60°, with sun heat.

To bring them into flower at Christmas they should be placed in heat about the middle of October, so that the forcing may be gradual. If forced too quickly, the flower-stems will be weak, and the colors will be anything but bright. Whereas, if they are brought on gradually, the flower-stems will be strong, the flowers large, and the color better. Here I may remark, that some sorts of Hyacinths are better adapted for either growing in glasses or forcing in pots. In most catalogues, such varieties are marked with an asterisk (thus *), and such should be ordered for this purpose, though for growing in pots, to flower late in the spring, almost any variety will answer.

When the bloom is in full perfection, the pots should be taken into a cool greenhouse, or window, and exposed to plenty of air. By that means they will last much longer in bloom than if kept too hot. After the blooming is over the pots may be placed behind a wall, and duly watered, sufficiently to perfect the bulbs. They will not answer again for forcing, but may be planted in the borders the following October.

Cultivation of Chicory.

CHICORY began to be grown in Guernsey in 1844 or 1845, and its cultivation increased rapidly until 1851, when the different dispositions of the government caused it to fluctuate much, and to decrease to the rate of the present year. At that time no less than six hundred acres of it were in cultivation in our small island, and which fetched 2*l.* a ton from the field, the average produce being about ten tons to the acre, making 20*l.* an English acre — 12,000*l.* in all. The advantages are, beside this handsome return, that a second or even a third crop may be grown, and it may also be followed by other roots; cattle also eat it, but I do not believe it will ever be a favorite feeding-root. The best way found here is to grow Parsneps, which are always carefully weeded, after Chicory, then Vetches, followed by Turneps. The price is now thirty shillings a ton, which reduces the value one-fourth; still, in the absence of the Potato, of which about 18,000*l.* worth have been exported in former years, the culture of the Chicory is valuable, if its market could only be stable. During the fluctuations in 1851, mentioned above, a few of the Farmers sold their Chicory at ten shillings a ton, which was ruinous.—*Col. Gard.*

Editor's Bureau.

The Frontispiece.

THE illustration selected for our present number, is the residence of CHARLES ANDERSON, Esq., now in the course of completion at the junction of Pike and Fifth streets, Cincinnati.

Of all the buildings of a private character existing in our city, we know of none which for picturesqueness, variety, and adaptation to locality, is more deserving of notice than this. It might correctly be designated *rus in urbe*, and indeed its peculiar position would qualify it almost as much for a country as for a town residence. The site on which it stands (as will be seen by an inspection of the ground-plan and perspective view), is not only very irregular in shape, but has, on the Fifth street side, a very steep and difficult descent. It was just one of those sites which, to an ordinary eye, would have appeared totally impracticable for building purposes, but which, in the hands of a skillful artist, is capable of pleasing and happy combinations. In this respect Mr. HAMILTON, the architect who designed and superintended the erection of the building, has succeeded admirably. Availing himself of the irregular shape of the ground, he has contrived to turn every foot of it to good account; making his kitchen and other domestic offices in the descent, so as to have them all as airy and as thoroughly lighted above ground as the best apartments in the house.

The approach from Pike street, is by a handsome double flight of ten stone steps, — the entrance-gate piers being flanked by a pair of lions, excellent copies in iron of Canova's well-known gems in St. Peter's at Rome. Immediately opposite the gates, is a beautiful double-arched angular porch of rusticated stonework, leading to the entrance doorway and hall. On the right of the hall, on entering, is a suite of two parlors and a dining-room, separated by large sliding doors, and presenting in their aggregate a length of sixty-five feet, and fourteen feet high;—a suite of rooms which we believe to be unparalleled of the kind in Cincinnati.

One feature in these rooms is deserving of notice from its novelty. In the parlor, fronting Pike street and looking up Fifth street, the window is placed over the fireplace; the flues being collected at the sides, and finally arched above in one central chimney-stack. This window will be closed at night by a shutter sliding in the wainscot, and to this shutter will be attached a mirror which will thus be placed opposite another fixed mirror over the dining-room fireplace at a distance of sixty-five feet. The effect of this arrangement, when the rooms are lit up, will necessarily be very brilliant.

At the end of the entrance hall is an open archway leading to the principal staircase which ascends the angular tower, surmounted by a Belvidere of open arches of very elegant construction. From this Belvidere and the flat roof to which it has access, a very extensive and beautiful view is obtained of the city and surrounding landscape. Passing by the staircase, we come to the Library, in the octagonal wing toward the north, and which, although on the same level with the parlors is (owing to the descent) the hight of three stories from the ground. The rooms on the second and third stories are lofty, airy, and well-arranged.

The building is in the modern Italian Villa style of architecture, of the form so peculiarly characteristic of Pisa, Genoa, and Florence. The style has been faithfully adhered to by the artist, and appears to us admirably adapted to our climate and usages. The structure is entirely of brick, with stone quoins at the angles, and finishings of stone round the windows and doors. The contrast presented by the two materials is extremely pleasing, and proves, in connection with the simplicity of the design, how much more beauty in architecture depends upon elegance of outline, adaptation, and correctness of form, than upon costly materials and elaborate ornament.

Importance of Botanical Science. — The Strawberry Question.

The following from a correspondent of the Philadelphia Florist, enforces the views I expressed in the first number of our Magazine, on the pressing importance of a knowledge of the principles of Botany to the Cultivator of plants and flowers. The suggestions of the writer have force, and they are reproduced here for the purpose of calling renewed attention to this useful feature of our New Series, the instruction alluded to being precisely what we propose attempting to give in our Botanical Department:

All cultivators of the soil should study Botany, at least, so far as reproduction is concerned; as it would enlighten their paths many times when they grope in the dark without it. If Agricultural periodicals, as well as Horticultural, had departments of Botany, and publishers enlist the assistance of scientific Botanists, they would be doubly remunerated for their extra expense by increased circulation, and the additional price their journal would command; the knowledge conveyed through such papers, would be tenfold more beneficial than whole books on the subject, as no more information would be given in any one number than an intelligent cultivator could study and comprehend in a month—and by such instructions he could at once discover the causes of success and failures, and would be on the alert to avert any calamity and guard himself against loss. What, let me ask, would the subscription of such journals be, when compared with the benefit of the knowledge acquired therefrom? But, on the other hand, editors should be required to have no favorites, nor tolerate such childish folly in their Botanical departments as has been published in the late "Strawberry Question."

I have read the whole article of this correspondent several times, but am unable to discover exactly what he is driving at, or for whom his castigations are intended. Somebody has been guilty of some "childish folly," which is reason enough, certainly, for the philosophic ire of those who have put away childish things. What the "childish folly" so earnestly deprecated, is, however, doth not so clearly appear—nor who has been betrayed into it. A rather large and interesting discussion is here suggested. What are "childish follies?"—not everything that seems so; nor everything that may hastily be called so. It is easy to denounce; quite as easy to laugh.

Nos hæc novimus esse nihil.

Yes, but not to me; not to many others; and not perhaps always so to the denouncer; for as the poet says—and many wise things have the poets said:

The things which now seem frivolous and slight,
May prove of serious consequence.

Let us try and keep step with truth and experience — neither running before, nor lagging behind.

But I am not going to discuss now the question to which all this leads—the alledged dioical character of the Strawberry plant. The opinions of this bureau are divided; or rather the good Doctor's opinion is pretty clear for the dioical theory, and the writer has not yet brought his to a satisfactory form and definition; and has none to express on the subject. The little Botany my studies have enabled me to comprehend, lead me to regard the dioical party as mistaken; misled by deceptive appearances. Either *they are*, or the most reliable and accurate writers in the science *have been*; and I must adhere to the science till I detect it in error. This, when next the Strawberry plants are blooming, I may be able to do; till then the discussion is deferred. This, however, may be relied on — that an attempt will certainly be made to bring the question to a decision, as far as we are concerned, the coming spring. Meanwhile, that the dioicists may see themselves as some others see them, we add the following paragraph from an editorial of the Florist, neither indorsing its spirit, nor consenting to its conclusions:

We really flattered ourselves that the Strawberry question was settled. Facts and science are so entirely against the Cincinnati theory, that we thought its advocates could have nothing more to say, but here we are again delighted with the information that certain intelligent and enterprising young men have not room for their extraordinary talents, and have commenced a revolution in Botany. If authority would have any effect with Messrs. Longworth, Elder & Co., we could bring forward the opinion of men as old as any of them — men who are celebrated Botanists, directly denying the truth of their theory. But thus far they have done nothing but talk of their experience, which is so very great, that they have not had room left for observation. The study of a few books would be of great benefit to them. We respectfully suggest that they should invest $1.75 in the purchase of Gray's Elements of Botany; after they have studied that carefully for a few

years, they might advance to LINDLEY'S introduction, or SCHLEIDEN'S Principles of Botany; but by the time they had gotten half through GRAY, they will be heartily ashamed of ever having believed any such theory. We would like to hear Mr. ELDER'S opinion of a very frequent variation which he must have seen, which is, the fact of petals taking the place of the anther of the stamen in some varieties of the Fuschia. This is the same difference of development which takes place when stamens are changed into pistils. According to his theory this should be constant, but it is not.

Complimentary Impromptu.

OUR fair friend, SALLIE—who dares to think she is not fair, and our friend?—SALLIE, we say, receiving our first number rather unexpectedly, was surprised by the apparition, into the perpetration of the following pretty lines, expressive, as Mr. Yellowplush would say, of her "inexpressible feelinks." We are thankful for the interest we shall have in her prayers, and hope to deserve her continued good opinion. None can regret more than ourselves, the indifferent representation of really very good strawberries, with which our first number was illustrated, and we appreciate her good nature in speaking of them so kindly. However hard our hearts may have been before—and the writer will seek an opportunity to prove to this Sallie, that his is not altogether destitute of tenderness; no, bless your gentle soul, Sallie, no; not altogether—however we may have been before, this touches us; at length we are softened. Strawberries in June, real strawberries, smothered in real streaming cream, could not be more tender, bland and unresisting; more perfectly subdued and ready to be "pitched into," miscellaneously, than we are at this moment. If there is one thing that can bring us down effectually, it is the smile and kind word of woman.

O Mr. WARD, and Dr. WARDER!
Why have you teased us so?
I fear your hearts are colder, harder
Than ice and snow.

Within our thoughts your tempting berries
Awaken sleeping crowds
Of fancies, linked with June and cherries,
And summer clouds.

They make us think of leafy shadows—
Of roses wet with dew—
Of daisies in the emerald meadows,
And violets blue:

Of south-winds in the hazel-bushes—
Of soft rains dropping down—
Of brooklets singing to the rushes,
And grass new mown,

And this, while frowning winter blusters
And mocks our shivering fears;
While still each wight his wrapping musters
To save his ears.

Ah me! no flowers these blasts will nourish,
Save ice-plants at our feet;
Or snow-balls in the air that flourish
On frost and sleet.

But though you've raised a fruitless longing
For spring's reviving hours,
Still, with your berries, hopes come, thronging
With brighter hours.

And, by your cheerful leaves enlightened,
If we may learn to rear
Such fruit—we'll pray your star be brightened
Each coming year.

CINCINNATI, O., 1854. SALLIE.

Editorial Correspondence.

FRIEND WARDER:

I am in receipt of the January number of the "Horticultural Review and Botanical Magazine," the amalgamation of an old friend, the "Western" with Mr. WARD'S projected "Botanical Magazine." Judging from the "Editor's Bureau," the contents and improved appearance of the number before me, the entire arrangements of the work have been altered and improved; and the more important subjects treated in a lucid and practical manner. The geographical position of Cincinnati, your present able Associations, and great facilities to obtain practical information on the various subjects connected with its publication, are such as will enable you and your friend WARD, to publish a *standard* work on *Horticulture, Floriculture, Botany* and *Allied Sciences*. The work, however, should be a plain and practicable attempt to teach the science and practice of the culture and management of the *kitchen, fruit*, and *forcing garden*, in connection with *Rural Architecture* and Ornamental and Landscape Gardening, and the principles and theory of Rural improvement; with artistic plans of Rural residences, and illustrative drawings and designs of Gardens, Garden buildings, useful and decorative Walks, Parks, Fountains, Gates, Fences and Plantation buildings, etc., rendering

the work at once of *vital* importance to the man of *taste* and *science*, the *Gardener*, the *Florist* and the *Pomologist*. And let me add, surrounded as you are by the most able and practical Vine Culturists in the United States, it should also be a *Text book*, "Theoretical and Practical," to the *Vine* and *Wine* producer. Will you not to the "Vineyard Series" *add* such practical information, as shall enable amateurs to know and understand the *modus operandi* of *gathering*, *mixing*, *stemming* and *crushing* the *grape*, *separating* the *must*, or *pulp* and *juice*, the *vinous fermentation* in all its details; the *Wine press*, (plan of) the management of wine in casks, *Racking*, *Fining*, etc., in fine, the *pretended secrets* pertaining to the "Art of Making Wine."

It would afford me great pleasure to give you some cheering information relative to Horticultural matters in this State; the various Horticultural Associations are in an incipient state, now and then emitting signs of life. I trust, however, they will ultimately resemble those germs whose vegetability is uninjured by long inhumation, and which await but an exposure to a favorable atmosphere to germinate and fructify. All, except the culture of cotton and corn, is an up-hill business. In fact, we have been ringing the bells backward for the last twenty years; as is self-evident from the fact, that every effort tending directly or indirectly to develop the agricultural, commercial and internal resourses of this rich and magnificent State, are, and apparently ever will be, blasted by Legislative enactments, or overshadowed by some sectional Poison Upas. And this whilst our enlightened neighbors in Georgia, Tennessee and the giant West, are affording "state aid" in reticulating their respective States with roads, etc.; thereby developing their true internal commercial, and agricultural resourses. Hence, in a ten-fold ratio, enhancing the revenues of their respective States, the value of their lands, property and Agricultural products. Alas, for Alabama, the definition of which is truly "*Here we rest.*"

Although, in the receipt of a large number of Agricultural and Horticultural works from all sections of the country, and in bad health, yet the apparent value of your excellent Magazine, induces me, with the kind aid of your quondam friend Col. Root, to send you the names of nine subscribers, amongst whom are his Honor the Mayor, and a few amateurs, with the amount of their respective subscriptions for the ensuing year.

Wishing you and your friend Ward, great success in publishing the Horticultural Review and Botanical Magazine, and promising farther "aid and comfort,"

I remain, sir, very respectfully,

Your ob't serv't,

Wm. De Forest Holly.

Oakland, Mobile, Feb. 8, 1854.

Dr. Warder:

Dear Sir,—I desire to express my thanks for your polite attention in sending to me the circular prospectus of your Horticultural Review. Last year I enjoyed the privilege of looking over its numbers, and considered it as one of the most valuable of our Horticultural journals. The addition now of the Botanical Magazine is a new feature, the character and value of which I should like to have an opportunity to judge, and hope you will send me a specimen number.

I particularly recollect reading with much interest, by your colleague, Mr. Ward, an article, I think, on the genus *Pancratium*, which led me to form a high opinion of his ability to supply a lamentable hiatus in our Botanical literature—I mean the want of a work in which all the new plants introduced into our green-houses and gardens, during the last twenty or thirty years, should be described in clear and technical language. I know of none such attainable in this country. My idea is, that a running series of articles, similar to the "Notices of Beautiful Plants," in Hovey's; or the "Appendix to the Encyclopedia of Plants," in London's Gardeners' Magazine — but much more full and exact in details, would prove exceedingly useful, and make your periodical in great request by all who love a garden. Every gardener, whether amateur or professional, at the present day, *is*, or ought to be, somewhat

of a Botanist. To make still clearer my meaning, let me ask what speed would a tyro make in determining such plants as those of which I here inclose a pinch of seeds, and which are but a specimen of very many cases of this sort which have puzzled me during the last few years? Or how can he know, when he has procured, with considerable trouble and expense, the seeds of a plant new to him, whether it prove true to its name?

Please hand these seeds to my namesake, and if he be, as I fondly trust he is, of a congenial spirit, they will not prove unacceptable. Both have been growing in my garden for some three or four years. How they came there, I know not, but suppose from seeds accidentally mixed with other seeds imported from abroad. I have labeled them with a mark of doubt. (?) No such names occur in our seedsmen's catalogues, though they may be there under other names.

[We omit our correspondent's brief descriptions of these plants, as we design presenting them, hereafter, in a more systematic and extended form.]

Our winter has proved to be of an anomalous character. Two snow-storms in one season has not occurred before during the 23 years I have resided here; and we have had rain and lightning in *any* quantity. Our extreme cold, as yet, was last Sunday morning, 16° above 0. This morning 48° 55″ at noon, with a dark sky, and drizzling rain. White, single hyacinths, three sorts of narcissus, as many of violets, dandelions, daisies, (bellis,) and a few verbenas, are showing flowers in the open ground. Persian frittellary, gladioles, tulips, &c., are coming up strong; and the buds of *Pæonia moutan* bursting. But they may rue it yet. I have seen the therm. at 5° in February.

Very respectfully yours,

MALTHUS A. WARD.

Athens, Georgia, Feb. 1, 1854.

Correction.

IN our February number is a singular error, that has, doubtless, attracted the attention of some of our readers. In the article on VITIS, speaking of the possibility of reducing the American species to two, I have specified them as "one with glabrous leaves (*foliis utrinque glabris*), and the other with tomentose (*foliis utrinque lucidis*). The last expression is but a synonym of the first, and being in my mind as a choice of expressions, was inadvertently used in the second instance for *foliis tomentosis*, and not afterward observed. The English terms are correct. J. W. W.

Agricultural Education.

The Wisconsin and Iowa Farmer expresses his hopes that the Legislature of the former State, will listen to the suggestions of the Executive Committee of the State Agricultural Society, and take favorable action upon them. This will be good news to the people locally interested, and will be hailed as a good omen, and must encourage others elsewhere to strive for a similar result. Those most deeply interested in the matter are moving in various places. Private establishments will spring up to supply the want. We have already noticed the bright prospects for usefulness of the Agricultural School in our own neighborhood, under the direction of Mr. F. G. CAREY. May there be many others, both public and private, to lend their aid in the elevation of the great interests of Agriculture, which must be intelligent, as well as practical.

Save your Peaches.

To keep peach-trees from freezing, we are told by a writer in the Evening Post, that at the Agricultural Institute at Hohenheim, in Wirtemberg, they strip the leaves from the trees immediately after the fruit is gathered, and then dig all around for three or four feet. This plan of root-pruning has been practiced in our own neighborhood with the same object, but I have not heard of stripping the leaves. Their removal is judicious, as it will be likely to prevent the swelling of the buds late in the season, a very probable cause of winter killing. The buds themselves, however, are the true seats of vitality, and will without the leaves be excited by warm weather during the winter; but, the additional treatment of root-pruning will have a tendency to check the supply of sap, and upon this may depend their immunity.

Flowering Shrubs.

Those who desire to enjoy the attractions of hardy vernal flowers, will do well to refer to the article upon this subject, printed in the last volume, of Review, in which particular reference is made to several of the beautiful flowering shrubs that make the garden and shrubbery ornamental at this period of the year. Among those which are very attractive, and, perhaps, still new to some of the readers of these pages, are the *Wiegelia rosea*, *Forsythia viridissima*, *Spirea prunifolia*, *Viburnum lantanoides*, and the older favorites *Halesia tetraptera*, or *Silver Bell*, the *Wistaria Sinensis*, *Cydonia Japonica*, and many others that should be found in every garden and dooryard.

Deferred Articles.

Among the articles that have been postponed is the *Orchard*, No. 2; 'Where and how is it to be Planted?' it was intended for this number of the Review, but has been crowded out and laid over for April; an essay upon the cultivation of the Willow is in hand, and will be based upon the statements of a large cultivator, who has promised to write full directions.

Journal of the U. S. Agricultural Society.

This organization, which is nearly co-extensive with our Union, and which is destined to produce great good, by eliciting the views and combining the efforts of the Agricultural community throughout our whole vast empire, will have held its annual meeting at Washington, D. C., before this number of the Review can reach its readers. It has an organ, the Journal, by means of which all of its members are reached, and through which they are informed of the doings of the society, as well as of the advance of Agricultural science and practice. This work will become more and more interesting with the increasing strength of the Association, and energy of its members. The third and fourth numbers of the Journal have been issued, during January, of this year, in one volume of 279 pages, in which much valuable matter, chiefly original, and furnished by some of the best writers of the country, has been brought together, and edited by W. S King, editor of the *Journal of Agriculture*, and Recording Secretary of the Society.

Some of the papers have been selected and marked as appropriate for these pages, and shall be furnished to our readers, especially those which relate more particularly to our own department of the great field of Agricultural Science.

The Horticultural Spirit,

Appears to be happily in the ascendant, down South. The Alabama Planter, says that C. A. Peabody, the editor of the *Soil of the South*, has originated a beautiful idea, in the suggestion of a series of floral exhibitions, at such periods as to encircle the entire South, during the vernal season. Thus, beginning at New Orleans, in April; Mobile, the 1st of May; Montgomery, Columbus, Macon, Savannah, Charleston, Columbia, Raleigh, Richmond and Baltimore. Oh, what a charming Maying, that would be! What a feast of floral festivity, would it not constitute for a Committee-man, or an amateur of floral productions, to pursue such a circle as is here chalked out, and how admirable the preparation for the rose or vernal show of the Cincinnati Society, by the first of June. Who will join in the pleasant pilgrimage?

A Horticultural Memento.

A very pleasant occasion recently transpired among the active Horticulturists of this vicinage. A company of the members of our Society, highly appreciating the efforts made in behalf of the cause, by our good friends Mr. and Mrs. Sleath, called at his residence on Boldface Hill, without giving any notice of their approach, in order thus to make a *surprise* that should add piquancy to the affair.

A beautiful and valuable silver cream-jug and salver, with suitable inscriptions, and a pair of coffee cups and spoons were presented with appropriate remarks, by Wm. Heaver, to Mr. and Mrs. Sleath, in the name of the Horticultural Society, as a testimonial of the high opinion entertained of the amiable disposition and virtuous character, as well as of the Horticultural taste and skill of this worthy pair.

A most hearty welcome was extended to the party, who were received as warm friends, and the cheerful Catawba, for which this vineyard has been celebrated, lent its aid to enliven the occasion. The presentation was made and appropriate acknowledgments tendered from overflowing hearts.

TRANSACTIONS.

State Fair of Indiana.

The Executive Committee met on Jan. 30th, and, after transacting other business connected with their office, it was resolved to hold the next fair at Madison, during the first week of October. It is anticipated that this fair will be second to none in the Union. So Buckeyes, and all others, may look out for honorable rivalry. The premium list has been revised, and much improved, in many particulars; but we do not expect perfection in such matters. The premiums are designed to bring out meritorious articles, and have here reached some of the raw material, which will be very desirable. Few will, however, be induced to prepare an essay on Agricultural Education, embracing a plan for establishing and conducting an Agricultural College, for the proffered silver cup, valued at twenty dollars. Nor will the architects furnish plans and specifications for a Farm House, to cost not more than one thousand dollars, for a similar award. I am glad to see liberal rewards offered for flax culture, and also for that of the willow. A trial of reapers and mowers will be held at Indianapolis, on Wednesday, the 28th of June.

Geological Survey of Indiana.

Dr. R. T. Brown, of Crawfordsville, has been appointed, by the Board of Agriculture, to collect statistics, and also to report a reconnaissance of the geology of the State. This will be a useful work, as far as it goes, but without an efficient corps of geologists, and a period of years, we cannot expect a complete report.

Agricultural Survey of Ohio.

When shall we hope to see our State Board moving in this important matter, and in providing lectures for the farmers? Both these objects might be well combined in one individual, but several persons, in different parts of the State, should be employed upon the work, which, indeed, is extensive, and will require many laborers, and much time. Desirable and useful as such efforts would undoubtedly be, it can scarcely be expected while the Board refuse to offer any premiums on essays upon agricultural subjects. Some of the best agricultural surveys I have ever seen, have been furnished in the Reports of New York State. They are models, especially the survey of Seneca county, by the indefatigable and lamented ex-president, John Delafield.

Horticultural Exhibition.

The Horticultural Society of this city have determined to hold their autumnal exhibition during the last week of September. The refusal of the State Board of Agriculture to accept propositions to hold their fair near this city, and their determination to go to the old Forest Fort, near Newark, have entirely released the Horticulturists from the proposition announced in the last number of the Review.

Agriculture in Maine.

The farmers of this State have been holding a consultation respecting their wants. They have taken the bit in their teeth, and tell their legislators plainly what they want, and what they will have. This is right, because they are right, and know what they want; and it is believed they will carry their point. The following resolutions were discussed and adopted:

Resolved—That a more general diffusion of agricultural knowledge among the farmers of this State, is essential to the promotion of this highly important interest.

Resolved—That an appropriation of the public lands belonging to the State, be asked from the Legislature, to establish an agricultural school, or schools, to be connected with a farm, or farms, for the purpose of promoting a systematic and scientific education in agriculture, among the youths of this State.

Among other speakers and discussions, the following appears to have attracted much attention:

Mr. Waring, of New York, was called upon to answer some questions, in regard to the value of Mapes' Improved Super-phosphate of Lime, as a fertilizer, and a very interesting discussion sprang up.

Mr. Waring gave a lucid explanation of the causes which make a dressing of that kind necessary, and mentioned instances of successful use of it. Other gentlemen gave an account of their experience in its use, which was favorable to using it, except in very dry weather.

The State Board of Agriculture of Maine, have held a very interesting session, at which the right spirit prevailed. The Board cordially approved the Resolves of the Farmer's Convention, and pledged their co-operation. The following order suits our case:

Ordered—That the Board of Agriculture recommend to the Legislature, through their committee, that the laws of this State, relating to Agriculture and Horticulture, be so amended that the Treasurer of this State shall pay to the Treasurer of each Agricultural and Horticultural Society in this State, as many dollars as each society shall respectively receive by tax contributions, or otherwise, from the members of said Societies, not to exceed the sum of $300 per annum; and there shall not be more than three such Societies in a county.

This was adopted in a modified form, so that if there be three societies in a county, they may draw $150; if two, $200; one not more than $300.

They recommended the Legislature to pass an appropriation of one township to an aca-

demy in each county that should connect an agricultural department to their system of instruction.

Mr. Waring submitted a manuscript of an agricultural text-book for the use of schools, which was examined and reported on favorably to the Board.

Cayuga County Horticultural.

Auburn, (N. Y.,) Feb. 9, 1854.

My Dear Sir,

The annual meeting of this Society, was held on the 8th inst., and the following-named persons were elected officers for the current year:

President.—George E. Barber, Auburn.

Vice-Presidents. — P. R. Freeoff, Auburn; John Morse, Aurelius; O. W. Wheeler, Auburn; John R. Page, Sermett.

Corresponding Secretary. — Horace T. Cook, Auburn.

Recording Secretary. — Lewis Paddock, Auburn.

Treasurer.—John S. Clay, Auburn.

Managers.—William Osborn, H. T. Dickinson, L. Q. Sherwood, W. D. Osborn, H. S. Dunning, A. V. Pulsifer, James L. Jenkins, William Cutting, Owen Burdick.

Committee on Premiums.—B. F. Hull, P. R. Freeoff, Geo. E. Barber, O. W. Wheeler, John Moses. Yours, truly,

Horace T. Cook, Cor. Sec'y.

Worcester County Horticultural.

From Hovey's Magazine the following accounts have been transferred.

The annual meeting of this society was held at their Hall, in this city, on Wednesday, December 4, when a reorganization for the current year took place by the election of the following officers, viz:—

President.—Hon. Stephen Salisbury.

Vice Presidents.—William T. Merrifield, of Worcester; John C. Whiting, of Northbridge; George T. Rice, of Worcester.

Secretary.—J. Henry Hill.

Treasurer.—Fred. Wm. Paine.

Librarian.—Clarendon Harris.

Auditors.—George T. Rice, Wm. M. Bickford, and a long list of Trustees.

The President tendered the Society the munificent donation of $3000.

New Haven County Horticultural.

The following gentlemen were elected officers of the society for the current year, at the annual meeting:

President.—E. A. Bishop, M. D.

Vice Presidents.—Stephen D. Pardee, Esq., and C. B. Lines, Esq.

Directors.—James Harrison, S. I. Baldwin, E. E. Clarke, Nathaniel A. Bacon, C. White, C. Beers, J. H. Totten, Jona. Stoddard, O. F. Winchester.

Recording Secretary.—George Gabriel.

Corresponding Secretary.—N. B. Ives, M. D.

Treasurer.—C. B. Whittlesey.

New York Horticultural.

At the annual meeting of the society, held on the 1st of December, the following officers were elected:

President.—Shepherd Knapp.

Vice Presidents.—Wilson G. Hunt, Wm. W. Livermore, John Groshon, R. L. Pell, Abm. A. Leggett.

Treasurer.—Jacob C. Parsons.

Recording Secretary.—Peter B. Mead.

Corresponding Secretary.—Geo. Wm. Curtis.

Librarian.—James Cheetham.

Finance Committee.—John Groshon, W. W. Livermore, H. M. Schieffelin.

Library Committee.—And'w Reid, P. B. Mead.

Premium Committee.—Peter B. Mead, Alexander Gordon.

Committee on Fruits.—Charles More, Thomas Hogg, Jr., Wm. S. Carpenter.

Committee on Plants and Flowers.—J. E. Rauch, J. B. Lenoir, Robert Reid.

Committee on Vegetables.—A. Bridgeman, John Suttle, Charles Knight.

Committee on Distribution of Seeds, &c.—Isaac Buchanan, Charles Place, Jacob C. Parsons.

On motion of P. B. Mead, the society voted to hold conversational meetings during the winter, for the discussion of various subjects of interest to the members. The first was to be held on Monday, December 5.

California Agricultural.

A meeting of those interested in agriculture, agreeably to a published call signed by several gentlemen, convened in San Francisco on Monday, December 5, 1853, J. K. Rose, in the chair, and W. N. Thompson, Secretary. A committee of four was appointed to draft a constitution, which was presented by Mr. Thompson on the following day and unanimously adopted. The following officers were then elected for the ensuing year:—

President.—F. W. Macondray.

Vice Presidents.—One from each county.

Recording Secretary.—C. V. Gillespie, Esq.

Treasurer.—Judge David Chambers.

Corresponding Secretary.—J. L. L. F. Warren.

Executive Committee.—E. L. Beard, Alameda Co.; J. K. Rose, San Francisco Co.; D. W. C. Thompson, Sonoma Co.; H. C. Malone, Santa Clara Co.; Wm. N. Thomson, San Francisco Co.

New Haven County Horticultural Society.

The twenty-third annual Report of this venerable association, has been kindly sent to the Editor, by a prominent member. It can only be acknowledged at this time, and most cursorily noticed, although its interest, and the accompanying address by the Rev. W. Clift, a devoted friend to the art, entitle it to more thorough attention. The report contains an account of the weekly Saturday exhibitions; with notices of the annual exhibitions and awards of premiums; both of which reflect great credit upon the society. The twenty-third annual exhibition and its accompaniments are satisfactory proofs that the true spirit of Horticultural emulation, is in full activity in the city of Elms, which is famous for its ulmic academic shades, and deserves to be styled the "Garden city of New England."

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The Grape—The Vineyard.

NO. IV.—CULTURE—GRAFTING AND LAYERING.

Working the Ground is advised by some to be done during April, and this period is generally selected by the Germans; others object to disturbing the soil too soon, on account of the supposed tendency to start the buds too early, and thus render them more liable to suffer from the influence of late frosts. They say also that the ground should not be stirred before it has become somewhat dried, warmed and friable; by this delay, too, one crop of weeds is destroyed in the operation, and the next is thrown back later in the season, so that the summer culture is rendered easier. This work is still chiefly performed with the heavy two-pronged hoe, of German origin, for which Yankee enterprise has not yet suggested an acceptable substitute; though some of the Americans fancy that a horse and plow or cultivator is quite as easy work, if not also equally efficient, or better; and they may be safely introduced where the vines have been widely planted, say three by six feet apart. At the same time that the ground is worked over by the Germans with their antique instrument, (the *bidens* rendered classical by Virgil,) these vine-dressers continue to cut off the small roots, which are thrown out pertinaciously by the stock near the surface of the ground—the propriety of this practice is seriously questioned by many cultivators; it is, however, urged by many good vine-dressers, who claim the teachings of experience, and say that no philosophical argument is needed, and so none is given.

Supposing that the ground has all been dug over, little hoeing is needed in May, unless a crop of weeds appears, in which case they must be destroyed. But some of our American vine-dressers, less *thrifty* than most of their German neighbors, have neglected dressing their ground in April. Carelessness and neglect are bad elements in farmers and vine-growers, but good may come of this neglect; we may discover some new and better rules of practice by their carelessness. Some of them, too, may have a reason for their tardiness. One says that he finds his vines, if not dug until May, do not start their buds quite so soon as those which have been worked at an earlier period; he thus escapes the danger of late frosts. Another says, that, being a farmer, he has other crops to see after at that very season, and he prefers waiting until they are all planted, as by this time he has a fine tall crop of green weeds to plow in, to feed his grapes; and as he has planted on a very gentle slope, and had forethought to set his vines three by six feet apart, there is plenty of room for old Dobbin and a sharp plow to pass along the rows, throwing out the furrows from the grapes, that cover up a fine bed of green manure, which will be nicely prepared for plowing back to the rows when the next tilling is required; his keen-edged hoes follow, and complete the destruction of the weeds.

The first week of May is recommended as a good time to work the ground; the objects to be attained are loosening the soil for the admission of heat and air to the roots, and also the destruction of weeds. The objection to working the soil earlier, is the danger that might be incurred of inducing the vines to break their buds too soon. A cold, wet soil, needing heat, requires more working than one which is lighter. On hills and dry places, where the rocks approach the surface, less working will suffice. On heavy soils the process needs to be repeated, if the rains have again settled the surface. The nurseries and young vineyards should be stirred frequently, say every month, and kept clean.

During the season, tillage is to be continued as far as necessary to kill the weeds. The cultivator may be passed through the rows; or, in hand-dressed vineyards, a light hoeing may be done, simply to kill the weeds—always using a sharp tool. If the plow have been used in May, throwing the soil away from the plants, followed by the potato rake or the two-pronged instrument, it may have become necessary, before June, to use the harrow or cultivator to check a rising crop of weeds; and if this has been done, and the moisture of the season forces up a new crop, the operation must be repeated, always recollecting that a shallow culture is considered best in the summer treatment of vineyards. If necessary to use the plow again to keep down the intruders, you should throw a light furrow toward the plants at this dressing.

It has already been indicated, that culture should be continued during the summer, rather with a view to keep the surface of the ground clear from weeds and grass, than as a means of stirring the soil deeply. Shallow hoeing from time to time is therefore recommended; which will sufficiently admit the air and warmth to the roots, and also aid materially in the decomposition of manures and other elements of the soil, and better adapt them to the use of the hungry rootlets of the vine. When horse power is used, the cultivator may be passed through the rows; or, with a light plow, furrows may be thrown toward the plants. All such labor should, however, be avoided in wet weather, especially if the soil be stiff and heavy. During August, the ground work must be confined to shallow dressing, with sharp hoes, merely to destroy intruding weeds. Be careful not to disturb the roots at this season, when the fruit is maturing and needs an uninterrupted flow of sap.

Having thus kept the ground gently stirred during the summer months, it is probable, that with the dry weather which so often prevails in August, there will be little grass or weeds to contend against. If they make their appearance, however, it is still necessary to keep them under by shallow hoeing, or by using the cultivator with a short singletree, to avoid injuring the vines—recollect that all summer cultivation should be shallow, having for its object principally the destruction of weeds. And how desirable soever it may be to keep the ground neat and clean, which will not be questioned by any one of good taste, not to mention the advantage to the vines, to allow them to be the sole occupants of the soil, still some good farmers, when they give the vines their last cultivation, have adopted the plan of sowing turnips upon the freshly stirred ground among them. This is recommended as furnishing a partial crop of edible roots that grow while the vine is dormant, and also provide a covering for the soil during the winter, and a green manure to be dug in for its melioration.

Grafting, is one of the modes of propagation well adapted to the vine, and a useful method of testing new varieties. This operation may be performed during April; it is considered best not to commence too early; some recommend waiting until the buds of the stock have begun to push out; the grafts having been kept in a cool place will not be so forward. This is done in the vine as in other plants, and is a very simple process. Different plans are pursued, but the general principles must be adhered to, and the idea which has been promulgated, that any kind of grafting will do for a grape-vine, (even boring a gimlet-hole in the stump of the stock,) will lead to disappointment. The union is very easily accomplished by the large cells of the callus growth, and the work is apt to be successful, if care is taken to adapt the inner barks of the stock and of the scion to each other. If not performed at or near the ground, so that the stump and point of union may be protected by a little mound of earth, careful wrapping, and protection from sun and wind, will contribute to success. Some use the root for this purpose, either loose, or in place, but under ground, so that a single eye of the scion shall project.

Grafting is applied to change bad sorts into good varieties, such as the wild vines on a new farm, which may thus be rendered productive at once. It also serves to multiply new sorts, or to exhibit the character of a new kind in the shortest possible time, for many grafts will yield fruit the first season. Persons who have one large vine of indifferent character, may produce several new plants of a better sort in a single season, by grafting on the branches, and at the same time, or during the summer, layering them. Some prefer always grafting into the roots, and old vines are often dug up and replanted in other sites on purpose for grafting—as already mentioned, pieces of root may be used, in the same way that other fruits are propagated by root-grafting—here the growth will not be so strong as when the stock is large and undisturbed. The growth of some varieties, when inserted into a vigorous root, is really astonishing. I have seen the Herbemont, set into a wild vine of an inch diameter, form a combined growth of one hundred feet the first summer: this included the side branches and laterals, which nearly covered a young hickory tree of twenty feet in hight, and furnished a number of layers the first year.

Grafting is not recommended, nor is it practiced as a general means of propagation—since the vine roots so easily that cuttings are mostly used—some varieties, to be sure,

are very difficult, and may succeed better by grafting. This plan is chiefly used with new sorts that are thus often brought into bearing the first season; it is also a capital method of transformation, and was thus applied at a very early day, as allusion is made to it in the Scriptures. A single eye or joint, with a little wood, is all that is required for a scion.

Layering, is a process that may be pursued with the grape as a means of propagation, designed to accomplish two different objects, and it is varied accordingly. It is called by the French *provinage*, and if applied, as is generally the case in the vineyard, to fill up a vacancy that may have occurred among the vines, it is effected by selecting a good shoot from the nearest vine. This should have been foreseen at the time of trimming, or even during the previous summer, and a long cane should then have been selected, and provided for the purpose, so as not to interfere with the fruiting of the vine. In the spring of the year, the space to be filled with a new vine should be thoroughly dug, and if necessary, that is, if there be an old decayed stump, it should be extirpated and new soil should be provided. The selected branch is carried along under ground, being buried in a shallow trench, and brought up to the surface at the point where the new vine is wanted. In Europe, this method is pursued to a considerable extent as a means of renewal, for it may be well imagined that a cutting, or even a well-rooted vine, would stand but a slender chance of life if introduced into the midst of a crowd of thriving plants that had full occupation of the soil.

The other object of layering is simply that of reproduction for the sake of increasing the number of plants, for sale or planting. It is practiced more especially with those sorts that have proved difficult to propagate by cuttings — such as the Herbemont, and Schuylkill—and also in certain stiff soils where even the Catawba has proved refractory in attempts to propagate it by cuttings. Here the process is performed in the same manner that has been described, by burying a shoot with its smaller end protruding from the ground to form the new vine, or still more economically, in the following method:—After the ground has been dug, a shallow trench is opened, about three inches in depth, and long enough to receive the vine to be layered; the latter is then laid in the furrow and pegged down to keep it steady; each eye or bud will then start as the season advances, and with care, each may make a good plant, for as they grow, the earth is drawn toward them and gradually they are earthed up, and a plentiful supply of roots will be thrown out from every joint, and by the autumn each lateral shoot will have become a good plant well rooted, and will be a saleable vine. It is surprising how many vines may be thus produced by a healthy old plant of the vigorous or strong growing varieties. In the latter plan, the layers should be removed and separated from the parent stock before the next spring, as they will thrive best in a nursery or vineyard.

J. A. W.

The Orchard.

NO. II.—WHERE AND HOW.

In a previous number, the general subject was introduced in its aspect of utility or practical application, in which the important question, WHY, was answered to the best of my ability, and the reader may have observed that there is some value attached to that peculiar mode of examining the subject, which, perhaps, was new to him; at any rate, there was a collocation of facts and circumstances, in relation to the planting of an orchard, that has not before been presented to the public so far as I am aware, and, therefore, I would beg for it the indulgence of the critical, because the novelty of the aspect, and perhaps, a want of more extended experience, may have induced the writer to compress too much the reflections that were suggested by the consideration of the subject, and he may have omitted, inadvertently, the exposition of some other possible *why* that did not rise up to his mind at the time and demand a pertinent reply.

It is now proposed to consider the *where* and the *how* of planting an orchard—two very important questions also, and upon the answers to which, much of the success or failure of the plantation will inevitably depend. First, then, for the location: let us endeavor to ascertain what will be the best situation for the apple orchard. It may be assumed that every farmer, and indeed every

rural resident, will desire to possess a collection of fruit trees, of greater or less extent, for his own use. Many such have little choice in the situation of their land, and as their chief object is for the supply of the family, the convenience of access to the fruit will constitute a most important element in the solution of the question. All such persons will desire to have the planting done very near the dwelling-house, but even here, the most elevated site should be preferred; as here, indeed, it will aid in protecting the buildings from rude blasts, and the foliage will also form a comfortable looking background to the rural landscape, which should always be so contrived as to be the most attractive possible, in the arrangement of the farmer's *home*. Ah! of how great importance is that idea of home! how much do we not owe to it, in the education of our children, as well as for our own comfort and happiness! but, alas, must we not confess it? how many thousands of our rural population do not appreciate the value of external adornments, as aids of the greatest importance, in making homes attractive as they should be: how many of our farm-houses are mere shelters from the storm, substantial though they be, while they should be beacon-lights, attractive in all their parts, external as well as internal, so as to shelter not only our bodies from the storms of the elements, but, also, to protect and draw toward themselves the thoughts and highest affections of the mind, and thus shelter our offspring from the dangers of moral contagion, to which they might be allured, and from which they will be greatly shielded by the neutralizing influences of an instinctive love of a lovely and loveable home—about which all the beautiful surroundings, even to the leafy background of the orchard, are found in the rural landscape.

Whenever it is possible, select an elevated situation for the orchard—there are several reasons for this, a few of which shall be considered—and though no one should be discouraged or deterred from planting, even though he be located in the level bottom-lands of our rivers, those who would establish large orchards, with a view to profit from the sales of fruit, should by all means be advised to select their sites in elevated and hilly regions, on account of greater immunity from frosts, the finer fruits that are produced with the better circulation of the air, and a soil generally better adapted to the purpose of fruit-growing.

First, as to climate, it has become a matter of notoriety, that valleys are colder than hills: this position has gained acceptance since the admirable papers upon the subject, written by Lawrence Young, of Kentucky, have been generally perused. That close and philosophic observer, although he anticipated the result, and was prepared to announce the proposition, did not rest satisfied until he had subjected the facts to the most rigid scrutiny, by placing thermometers among his trees at different points, in regard to the level of the surface. He found a material depression of temperature in the low grounds, even where the change in elevation was comparatively trifling—this was most remarkable upon still nights, when the cooling process was less affected by vibrations of the atmosphere; indeed, there is a very general popular belief, founded on observation, no doubt, that there is the least injury done by frost in windy weather. The reason of this is dependent upon two circumstances. It is known that the cooling of the earth, and the air near its surface, is not caused by the simple absence of the sun's rays, but also by the process called radiation, by means of which objects are always giving off their heat; this is apparently in excess at night, because the in-coming supply from the sun is then withheld. Radiation proceeds most rapidly from the darker soils, just such as abound in the low places; here, then, is one cause of the greater cold. Another and more forcible one, however, under the circumstances assumed, of a calm atmosphere, is the greater density or weight of cold air, which causes it to descend from the elevations and accumulate in the lower grounds.

These principles being found true of the slight inequalities of the surface, are equally proved by observations made upon a larger scale, such as the comparison between a valley and the neighboring ridge, where very marked differences are found to exist. These are not indicated by the delicate instruments alone, but are often most apparent in the devastations among the crops, in field and garden, produced by the rime and hoar-frost that will abound in the valley, when it is not observed upon the hill. Several

instances of this kind were noted in some papers upon the *Effects of Frost*, that were printed in this work during the summer of 1852, when the terrible results of the May frosts were very generally felt in this region.

Another advantage of elevated positions for the orchard, consists in the character of the soils that are generally found in such situations—they are less rankly fertile and less productive of excessive wood-growths than the deep alluvials that prevail in the bottoms. This appears to be a condition most favorable to the highest development of the apple in its greatest beauty and perfection. Upon hills there is generally a more probable immunity from the lichens, that so often disfigure the fruits produced in the damper atmosphere of lower levels, which is also less stirred by the winds. The very texture of the fruit, and, consequently, its improved keeping qualities, is undoubtedly superior upon the thinner soils of the hill-lands, than elsewhere. These are mere matters of observation, now cumulating and not to be gainsayed, but rather spread out before the public for the sake of guarding them against mistakes in selecting the sites of large commercial orchards, than with any desire to prejudice the thousands in the country which are planted in the other class of sites and soils, for the very good reason that they must have been planted there, or not planted at all. There are soils and situations, however, which are so bare, broken and rocky, as to be unfit for cultivation; if such are planted as orchards, it will be unreasonable to expect so heavy, or so fine crops of fruit as where judicious culture can be furnished.

Having settled this question of situation, that of soil ensues as a matter of considerable importance; for no one can doubt that the permanency and success of the orchard will depend very much upon whether the trees find sufficient and proper aliment from which to elaborate their desired products. In this particular, however, we are relieved from any great anxiety by observing that the apple-tree thrives in almost every soil that contains the usual mixture of materials that is common to all reasonably fertile land: certain definite elements are, however, necessary; among these are potash and phosphate of lime, which enter largely into the constitution of the plant and its products, and should exist in the soil, or they must be applied artificially.

Too little attention is paid to the preparation of the land; it is believed, and has been fully demonstrated, that a thorough tillage before planting is very conducive to success. If the orchard be set in a piece of newly-cleared ground, the stumps and roots will preclude the possibility of thorough plowing; the trees will, however, often grow and thrive remarkably well under such treatment as they can obtain in a new clearing, where we find at least an immunity from hard furrow bottoms. Even here, a complete breaking up of the soil should be practiced before planting. If the ground be clear of stumps, by previous tillage, or if it be open prairie, too much pains can scarcely be taken in deep plowing and subsoiling as a preparation. This is the more important, in as much as the trees will constitute a permanent crop that will prevent such thorough tillage in the after culture. For three or four years after planting, the ground should be kept in tillage, either with or without root-crops, avoiding the introduction of cereals, for the double purpose of preventing the consequent abstraction of elements that will be needed by the future crops of apples, and also, that the constant culture of the soil by tillage may not be interrupted.

After the second or third year of tillage crops among the young trees, which will have encouraged them to make a vigorous growth, some orchardists will find it advantageous to sow a green crop, such as buckwheat, oats, or peas, to be pastured off by hogs, before they ripen. It is believed that the green manure, thus left with the animal droppings, will be very advantageous, and may be plowed in with good effect. The swine will not be apt to injure the trees materially, unless they are kept on too long, so as to pasture the green crop very closely. In all the tillage, the greatest care must be exercised to avoid wounding the bark by carelessly striking the stems with the singletrees, when the plowing is done with horses; an additional hand will be needed in plowing next the trees, to save them. When the trees have made a good growth, and begin to bear handsomely, the tillage may be suspended, and the ground may be sown to

clover, to be pastured with swine for a year or two, and again broken up and tilled.

Many orchards have been planted in grass lands, however, without any especial preparation of the soil, as above recommended. When this is necessary, there should be a substitute for the thorough and continuous tillage; this consists of spade-husbandry. The ground about the trees must be turned over with the spade, in a sort of rough digging, twice or three times a year; in the fall or early winter, in the latter part of spring, and again during the summer, so as to make the earth loose and mellow, and to keep down the weeds. This digging should be about six feet in diameter, and gradually increased, as the roots extend; it should be shallow next the tree. In some situations this kind of treatment will be necessary, and must be adopted as the best that can be employed; but thorough and continuous tillage with the plow and cultivator is recommended for several years; indeed, some persons insist upon constant culture of orchards, as conducive to their best success; one or two plowings during the season, with a naked fallow, or green crops turned in. In Illinois, a strong prejudice exists against the admission of grass in the orchard, as it is observed that the fruit is inferior in its appearance, and frequently blotched with black, hardened portions of skin, an appearance which is there termed "grass-fed." The trees will often continue their growth longer when cultivated, and consequently they will not bear so soon; but they will be able to produce more largely when they reach the productive period, even though it be a few years later.

The question, *How* is the orchard to be planted? remains to be answered, and this is a matter of the greatest importance, as the utmost care in the selection of the trees, and in removing them from the nursery rows, as well as constant attention to them during after years, will be rendered, in a degree, nugatory, if the young strangers receive an injudicious introduction to their new homes. Labor properly applied at this stage of the proceeding will be amply remunerated.

The distance at which the trees should be placed, will depend upon the soil, and also, in a great degree, upon the character and habit of the variety; since some kinds are much more thrifty and grow to a larger size than others. As a general rule, the richer the soil, the greater the space that will be required. From this suggestion a valuable inference may be drawn:—that trees, particularly for large orchards, should be studied in regard to their style of growth, and assorted accordingly, before planting. Thus, there are some kinds that will do better if set at twenty-five feet apart, than others planted at forty-five feet distance. As a general proposition, trees should not be too much crowded, and when the price of land is of small moment, compared to the success of the orchard, forty feet may be assumed as a good average distance: two rods is a very common allotment.

I append a list of some of the coarsest growing and some of the most compact and least diffusively branched varieties:

For wide planting.—Rhode Island Greening, Pennock, Summer Queen, Newtown Spitzenberg, Vandervere Pippin, Roxbury Russet, Fall Pippin, Yellow Bellefleur, Fallenwalder.

For close planting. — American Golden Russet, Juneating, Lady, Rawle's Janet.

It is often advised to plant the apple-trees wide, and alternate with peaches. This enables you to be in the way of receiving a crop of one fruit while the trees of the other are growing, and thus to be remunerated for the labor of culture at an earlier period. I am not aware of any valid objection to this plan of mixed planting, as the peaches will generally be out of the way before the apple-trees have so extended their branches as to need the space they had occupied.

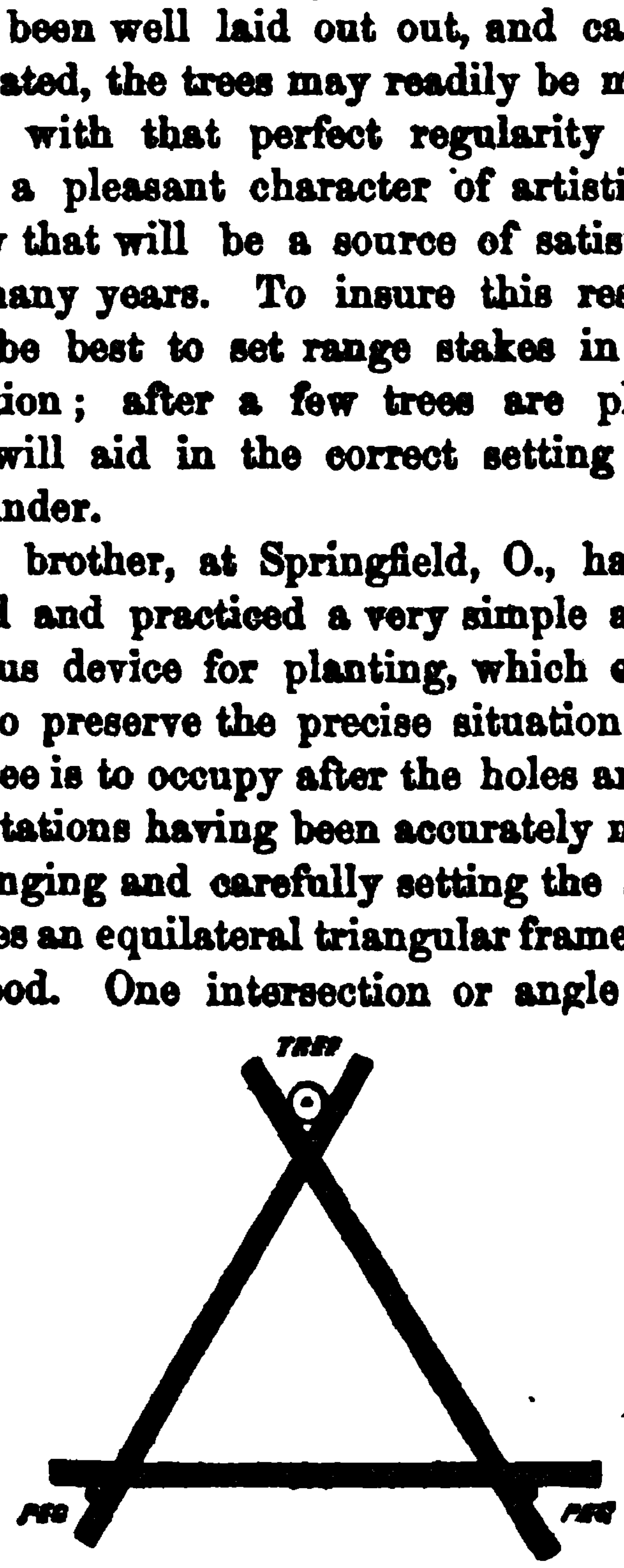
Laying out the ground will afford an opportunity for the exercise of some taste and fancy, and will require accuracy. The usual form is that of a square, or in rows crossing one another at right angles. But many advise wide planting in this manner, and the addition of a central tree between each rectangle; this is called the *quincunx* method. The only recommendation this style possesses, is its antiquity, for it was introduced by Columella; but this, and the greater number of trees, are counterbalanced by the increased difficulty of culture. The hexagon style has also been suggested, but I could never discover the peculiar advantages which are claimed for either of these methods. The rectangle affords the greatest

convenience. Whatever plan be adopted, the places or stations for the trees should be marked by a stake, which will indicate the positions where the holes are to be dug.

The stations should be prepared by opening large holes, if the ground has not been thoroughly prepared by deep plowing—if, however, the soil be mellow, the excavation need not be larger than the roots of the young trees require for their accommodation; from eighteen inches to two feet square, and about one spade deep. If, however, the land be in grass at the time of planting, the holes should be made four or five feet in diameter, and should be deeply excavated. It has been very judiciously urged by J. T. Worthington, in the *Ohio Farmer*, that the excavation should be made in the fall and winter, so that the soil may have the benefit of the winter frosts.

Planting the trees will require the exercise of great care and judgment. If the stations have been well laid out out, and carefully excavated, the trees may readily be made to range with that perfect regularity which gives a pleasant character of artistic propriety that will be a source of satisfaction for many years. To insure this result, it will be best to set range stakes in either direction; after a few trees are planted, they will aid in the correct setting of the remainder.

My brother, at Springfield, O., has suggested and practiced a very simple and ingenious device for planting, which enables him to preserve the precise situation which the tree is to occupy after the holes are dug. The stations having been accurately marked by ranging and carefully setting the stakes, he uses an equilateral triangular frame, made of wood. One intersection or angle is set



against the stake, the frame is laid upon the ground in any direction, and the other two angles are marked by driving in two little pegs, which are to remain until the tree is to be planted, when the base of the triangle is again applied, and held against the two stakes, and the third angle will indicate the true position for the tree.

We shall not need the theories of the terraculturist, but simple observation, to induce us to plant the trees at the same depth they previously occupied in the soil—the *collar* should be at the surface. To this end, the hole should be partially filled with good mellow soil, a little raised in the middle, and upon this bed the tree is to be placed, in its proper position in regard to range and depth. Then the finest mould is thrown lightly upon the roots, after they have been carefully spread out. Gentle pressure by the foot will aid in setting the earth about the roots, after taking particular care that the fine earth has been well worked in among the fibers. Some planters recommend the application of a bucketful of water at this stage, particularly if the soil be dry; but others consider this of doubtful propriety, particularly when the land is stiff and clayey. Where the natural soil is poor or unkind, and not well prepared, it will be necessary to use a good compost for filling up the holes; but great care should be taken to avoid the application of any strong or fresh manure. Rotten sods, with old decayed chip manure, or cow-yard scrapings, well incorporated and treated with lime and ashes, or some other judiciously prepared compost, will be available, but should have been prepared beforehand. In filling up around the tree, less care will be requisite as to the character of the earth. The surface should be made a little rounding, to allow of settling, and also to prevent the accumulation of water in a wet season; this is to be particularly observed in fall planting. The relative propriety of planting in the spring or autumn will not be considered in this place, as this question will be worthy of more extended discussion. It is my preference, in most situations, and under most circumstances, to plant in the fall, but all are urged to plant, and if that season have passed, do not fail to embrace the spring. In concluding this important branch of the subject, let me repeat a few directions:—Carefully examine the roots, and remove with a sharp knife all those portions that have been unfortunately torn or wounded by

carelessness in digging at the nursery, or in transportation. Set the roots upon a bank of mellow earth, spread out every fiber in its natural direction, fill in with the most mellow soil or compost, shaking the tree very gently, and working in the dirt thoroughly; fix the roots by a gentle pressure of the foot, and then fill up the hole to the proper level of both tree and surface. In dry weather, it may be necessary to leave a slight concavity or hollow about the stem, so as to retain moisture until it can soak into the earth; but in newly-planted trees it is better to sprinkle the tops. *Mulching*, or covering the whole surface above the roots with straw, or other litter, so as to prevent the evaporation of moisture, will be found of inestimable value, particularly in a season of drought.

Many collateral topics, immediately connected with this subject, have suggested themselves to my mind while writing this article, but they must be laid aside for the present. Such are, the mode of growing trees in the nursery, and consequently, the mode of training them in the orchard—especially with regard to low heads—the manner of digging them from the nursery rows, packing, transportation, and many other circumstances will be, however, deserving of more elaborate consideration upon another occasion. J. A. W.

Agricultural Relations of the Summer Climate of 1853.

BY LORIN BLODGET.

The prosperity of the United States, as a whole, is intimately connected with and dependent upon its climate. Its greatest business interests are those of agricultural production, with those immediately dependent upon them, as the direct exchange of, and commerce in, raw products. To the planting States, more particularly, a knowledge of the permanent climate of every district is most important, as a guide to its general productive capacity, and to its special adaptation to particular products.

The characteristic productions of this portion of the continent of North America, are also very sensitive to inequalities and extremes of climate. Striking instances of these extremes occur in almost every year during some part of the growing season, which, on account of the extent of country, and the great range of particular products, cause more or less loss in each instance.

The most immediate and obvious interest in meteorological research is in reference to these extreme changes, and in their relation to the general or mean conditions of climate.

The territory embraced by the United States east of the Great Plains, is an immense area of the highest productive capacity. It is too great for uniformity of condition in the summer extremes of temperature, or amount of rain, though these changes are always symmetrical over considerable areas. The fluctuations in productions may therefore compensate each other in any one instance, or in the whole period affecting the summer growths. With most branches of the agricultural interest, this is usually the case, and, whatever may be the extent of loss in some districts, the sum of entire production, in consequence of the full occupation of a territory embracing such diversity of climatic character, has come to differ little in successive years.

The staples more peculiarly commercial are more limited in their range, yet there is but one, the cane sugar of Louisiana, found within such narrow limits as to be uniformly influenced by any peculiarities of the season of its growth. Every other considerable product has so wide a range that opposite extremes of temperature or amount of rain may at the same time influence the more widely separated districts adapted to it. We require a knowledge of the meteorological conditions of the whole country, therefore, to judge correctly of the entire effect.

A striking illustration of the truth of this remark is afforded by the summer of 1853. The cotton crop has been favored west of the Mississippi, and is there unusually abundant; on the Mississippi and in the States near it eastward, the unusually wet character of the season has seriously injured it, and at the extreme east, drought in the first instance, and rains subsequently, have still more injuriously affected it. The high temperature and profuse rains of the lower Mississippi have, at the same time, brought the cane to great perfection.

With the usual supply of rain, the mean temperature of any month of the growing season is, in our climate, a very direct measure of its comparative productiveness. Single extremes of temperature are less important in their influence on the productive character of a season, unless they reach a frost, and in any case they are easily defined, and the precise degree of their importance may be promptly stated. In England, a greater uniformity exists in temperature, yet a depression to the minimum of the monthly mean for any month in the growing season never fails to produce injurious effects, and is often disastrous to important staples. We have here a far greater range of temperature in the mean of successive months, and we have greater contrasts also in various dis-

tricts. The extremes of climate, and their effects, are all more signal here, in the localities which bound them, than in England and Eastern Europe. Vegetable growths are therefore more irregular and variable, and as any season may present extreme conditions of temperature or amount of rain in any direction, and as any month may do so even more decisively, this diversity of districts renders great caution necessary in drawing inferences of a general character. As before suggested, the injurious extreme of one month may be compensated by an opposite one in the next, and the local injury, or even absolute destruction, in one district, may be relieved by profusion in an adjoining one, which would neutralize its effect in some degree on the general market.

It is important, in any case, to know as soon and as definitely as may be, what the measure of the peculiarities and extremes of any season is, and what may be the reasonable inferences of effect on the great agricultural staples. Apprehensions may often be dissipated in this way, and provision made against the consequences of failure in time to prevent contractions in business and changes in prices; each of which is injurious beyond the original calamity, in the degree of precipitancy and misapprehension attending it.

The effort to accumulate and apply the statistics to this purpose can not, at least, be without some effect in directing attention to precise statements, and to the value of climatic observation.

The usual vague statements of general or single extremes are little to be depended upon, without comparison and verification.

The first three months of the year are scarcely included in this general purpose; unless distinguished by unusual severity of some feature of climate, they have little influence on cultivation, and only a partial control over any of its interests. For the present year, neither of the first three months had any extraordinary character; they were generally somewhat above the mean temperature and with few extremes of cold. In March, the rains were heavy at the South; otherwise the precipitation, or entire amount of water falling in rain and snow, for the three months, was of the usual quantity, and quite equally distributed.

In April, there was deficiency of rain and a somewhat injurious drought in Maine, the usual amount in Vermont, and much above the usual amount in Massachusetts, Rhode Island, and Connecticut. In the interior of New York there was the usual amount, and an excess in Central and Western Pennsylvania, and along the more elevated and western portions of the States south as far as North Carolina. On the plain of the Atlantic coast there was the usual amount to a point about as far south; but the quantity suddenly fell off in South Carolina to very little, and in some portions of Georgia and Florida there was none during the month. In the remaining States south of Tennessee, the amount was small, usually less than half the average. In Tennessee, Kentucky, and Ohio, the amount was greater than usual in some degree; in Michigan about twice the average. In Indiana and Illinois, near the usual amount fell, with a great excess in Iowa and Wisconsin.

In May, it continued excessively dry at the South in the same districts affected in April, with a slight exception just on the Atlantic coast. The distribution was much the same northward, but with some excess in Lower Virginia, and Eastern Pennsylvania and New Jersey. In all the Northeastern States the rains were very heavy in May, usually twice the average amount. Central New York had no excess, however, and there was the mean amount in Western Pennsylvania and the adjacent portions of Ohio. In Michigan, Wisconsin, and adjacent parts of Indiana, Illinois, and Iowa, the amount was even more excessive than in April—the States south, in the Mississippi valley, having a little less than the usual amount.

The effect of this distribution for the two months most important to the planting States, was extensively injurious. At the North, April scarcely enters into the list of months affecting cultivation, and the profusion of rain was favorable to all that could be affected at that time, as it was attended with unusually high temperature in New York and in the New England States.

The absence of rain in some parts of Maine in April was the only unfavorable event in the general and early advancement of vegetation at the northeast through both months.

In the Northwestern States the temperature was but slightly higher than usual, and vegetation little beyond its usual stage of advancement. In Kentucky and Tennessee it was more decidedly warmer, being from three to five degrees above the mean temperature, and, with the considerable fall of rain, unusually favorable.

May was usually colder than the mean at the South, though its mean was not so low as the effects of the month on vegetation might seem to show. There were several extremes of cold, and these in connection with rains also, which were quite unfavorable at the West in this month; and in the States of Alabama, Georgia, and eastward, the drought was very severe. The effect of the absence of rain in any considerable quantity in a large area here, from March to some time in June, was generally injurious, and in many instances quite destructive to whatever was capable of injury at the time.

North of North Carolina the rains were abundant in May, some of them cold and unfavorable, though none were as extreme as in Kentucky and Tennessee; and one only of the frosts which occurred several times, in those States, and to near the close of the month, occurred at Philadelphia, or further South, except at considerable elevations in the interior. This was a slight frost in parts of lower Virginia and North Carolina on the 14th and 15th.

In Central Pennsylvania and Western New York, the usual changeable character of the month was experienced, with a favorable preponderance in most respects. In the New England States, the temperature was higher, the amount of rain greater, and the season more advanced than elsewhere. The rains were uniformly distributed and abundant in these States, and the number and severity of frosts not greater than in Kentucky and Tennessee. All vegetable growths were brought forth rapidly, and were much in advance of those of the same latitude at the West. The mean temperature of May in Vermont, New Hampshire, and adjacent parts of other States, was from two to five degrees above the general mean.

In Ohio, the mean temperature was slightly greater than usual, and the seasons not unfavorable; but further west, in Illinois and Iowa, the mean for the month was two to four degrees below the average, and, with the frequent frosts and some severe and cold rains, vegetation was generally retarded.

In June, the extremes of every sort were equally decided, though not, as in May, of an opposite character in different parts of the United States. It was characterized by excessive heat and severe droughts almost every where, to the last of which extremes the only exception was in Wisconsin and Iowa. In these States, only the rain was profuse, and somewhat greater than the normal mean. The almost universal deficiency of rain for this month has scarcely been equalled, and the partial exceptions, or mitigations, rather, in addition to that just mentioned, were in Lower Florida, some parts of Virginia, and of Northern Ohio and Eastern New York, with Western Massachusetts. The vicinity of New York city was the only decided exception east of Wisconsin.

The temperature of June was uniformly very high, reaching the highest point of eight and nine degrees above the normal mean in the Western States, and it was generally equal to that for July, while the mean summer curve places it three to four and a half degrees less.

The continuation of the long drought in Georgia and parts of adjacent States, which began at the close of March, was complete to the last of June, and the general expression of those interested in agricultural affairs there, was that the failure of important staples would be extensive.

The same extreme absence of rain produced decidedly unfavorable effects in Massachusetts and portions of adjacent States. The close of the month was a period of most extraordinary heat in the central parts of the United States, without sufficient rain to relieve vegetation, except in the vicinity of New York city.

In July, at the South, the rains became abundant and even excessive in the districts of severe drought up to that time. In the planting States east of the Mississippi, they began near the first of the month, and were continued and profuse throughout, giving, as the amount of water falling, from seven to eleven inches, or nearly twice the mean depth. At New Orleans, and at Cedar Keys, Florida, the amount was eleven and a half inches.

Some of these flooding rains were locally injurious, but such injuries were confined to the overflow of river bottoms, and the usual destruction from thunder-storms of limited extent. The mean temperature of the month was very near the general mean, and only equal to that of June at the South, except immediately on the Gulf coast.

For the planting States, the character of the month may be briefly summed up as extraordinarily favorable, and as going far to neutralize the greatly unfavorable character of the preceding months.

In Tennessee and the States west, and in all districts in this latitude, the rains were near the usual amount, and well distributed through the month. In Central Illinois there was some deficiency, but further north, in Iowa and Wisconsin, an excess, reaching to near double the usual amount.

In Michigan, Eastern Ohio, and Western Pennsylvania and New York, there were severe droughts through the entire month, and continuing into August. Portions of Central and Eastern Ohio, and of Pennsylvania, suffered most in this month, and the effect was disastrous on some products, and especially on the grazing interests. West of Harrisburg, Pennsylvania, with some exceptions of violent showers in limited districts, the rains for the month were very small; and the same conditions prevailed in Central and Western New York, while the eastern portions of both States had profuse rains nearly throughout.

In the New England States there was no exception to the general sufficiency and equal distribution of the precipitation, and the temperature was rather above than below the mean — in Maine decidedly above the general mean. In some parts of the country, the month appeared colder than usual by the contrast with June, but that it was not so in reality, is proved by the best comparisons we are able to make with well-determined mean quantities.

August, in most parts of the United States, was equal in temperature to July, and warmer than usual by the normal difference between these months, which difference varies from two to three degrees in the Northern States, and disappears gradually toward the Gulf coast. The early part of this month was excessively warm every where, but the latter portion had a singular extreme of cold, resulting in frosts in portions of Michigan, Wisconsin, Northern Iowa, Illinois, and Indiana. Some decided injury was done to the crops in parts of the first mentioned States, more conspicuous, however, from its rarity than important in amount.

The distribution of rain for August was very unequal in the various parts of the country, and also through the month at any locality. The dry period, already so severe in Western New York, continued through much of the month in some elevated districts, and in some parts of Michigan, Ohio, and Pennsylvania. In the East, and about New York city, the rains were excessive—the district of greatest excess, from Lower New Hampshire to Northern New Jersey, varying from seven to twelve inches in depth of water fallen.

At the South, the amount of rain was not far from the average, and very well distributed through the month. Some portions of Georgia were deficient, and there was more than the usual amount in South Carolina.

The unfavorable points of the month were some damage from excess of rain at the East; some prolongations of the drought in the grazing districts of New York, and slight injury at the West from frost and absence of rain.

September was above the normal mean temperature in all parts of the United States, to the amount of two or three degrees in some parts of the West, and one to two degrees over the entire North and East. Its character in this respect was favorable, though extremes of temperature become very important to some descriptions of cultivation in this month, and some notice of its frosts is required to complete the purpose of this statement.

The first frost in Maine and New Hampshire occurred on the 12th, the second on the 25th; the last of which was the decided check of vegetation. In Vermont, at Burlington, and in the eastern parts of Massachusetts, the first frosts were on the 25th, and variably on the 30th.

In New Jersey, the first frosts were on the 30th. In most parts of Pennsylvania, the first frost was on the 30th, though elevated districts had light frosts on the 12th. In Maryland and the mountain valleys of Virginia, there were also frosts destroying vegetation on the 30th, but no injury was done on the low plain of Virginia nor southward, though slight frost appeared in some places.

In the hilly parts of Southern Ohio there was light frost on the 28th, and on the lake shore at the North.

In Michigan, there were light frosts on the 10th, with "killing frosts" on the 23d, 25th, and 28th.

In Central Indiana, the first frosts were on the 20th and 23d, and the same in Central Illinois. In some parts of Iowa and Wisconsin, the first severe frosts were on the 31st, though the most elevated places had frosts on the 8th.

September is less important than other months in the influence of its amount of rain on producing interests. The amount was again very large at the East and in the South, amounting to fifteen inches at Cedar Keys and Pensacola, and to ten inches from Jacksonville to Charleston. Some damage was done by these rains in retarding the development of the cotton boll and by flooding low lands. From the most important localities in the Southward which might be influenced in this manner, our information is meager, and it is only known that some complaint is made of this result generally by Southern observers. In parts of the Northwest, and especially in Michigan, it continued dry.

Of the remaining portion of the season affecting vegetation, it is only necessary to give the extremes which close it up at the South. The mean temperature of October is comparatively unimportant, except to semitropical cultivation, and to the grazing interests of particular States. The extremes which bring the "killing frosts" are, however, peculiarly important in American seasons, and to distinctively American staples. A brief notice of this point is sufficient here, from the signal character of this "killing frost," in the present year to the farthest point southward the phenomenon ever extends.

At Charleston (S. C.) there was killing frost on the 21st October, and universally over the entire South, on the morning of the 25th. This was probably the first damage to the cotton-planting interests any where, though in the uplands of several States there were frosts as early as the 14th.

The retarded cotton crop no doubt suffered much injury at the last. The rains of September, and the generally wet character of the latter parts of the season, together, added a considerable item to the first cause of failure in the early droughts. Some injury was done by frosts early in October, to the tobacco crop of Virginia. To this staple the season was generally favorable, however, with slight exceptions. To give the fullest value to these comparisons, a clear limitation should be made of the districts having peculiar climatic adaptation to the several staples of agricultural production. This requires more space than can be here devoted to it.

Letter on the Pear.

BY J. P. KIRTLAND.

FIFTY years since, my attention was directed to the cultivation of the pear, by the observations of an old and experienced nurseryman. At that day, there might be seen, in certain localities, a few lofty and venerable pear-trees—the productions, perhaps, of the seventeenth century. They were still healthy and productive. The varieties were limited, but embraced, among others, the Summer Bon Chretien, then known as the Summer Bell; one akin to the Julienne of the present day; and another universally denominated the *Summer* or *Harvest Pear*. This last I continue to cultivate, and consider it preferable to either the Madeleine or the Bloodgood; though I have never found it described in any work on Fruits.

Few trees of recent growth were to be met with, and it was then, as at present, a popular belief that this fruit could not be cultivated with any prospect of success. Of course, not many efforts were made, and they were illy directed. Their results seemed, in most instances, to confirm the correctness of popular opinion; yet occasionally a young tree would thrive in spite of adverse circumstances.

In the year 1810, I first visited the northern parts of Ohio, and found seedling pear-trees springing up in the most of the nurseries and orchards of the new settlers. In my subsequent visits, in the year 1818, and especially 1823, I regretted to find that a large proportion of those seedlings were disappearing under the attacks of a disease said to be "the *fire blight*." A few survived, and have continued healthy down to the present period.

During the summer of 1824, I reared an extensive nursery from the seed exclusively, and diffused the trees extensively over Northern Ohio and Western Pennsylvania. Like their predecessors, they soon disappeared; leaving, however, an occasional survivor behind.

I have recently had an opportunity to examine the lofty and beautiful pear-trees on both margins of the Detroit river, in Michigan and Canada. These trees were planted by the early French population, and have survived from one to two centuries. Many of them were loaded with fruit at the time of my visit.

The day has passed when horticulturists should, like our soap-making mothers *of old*, impute such diverse results to "*good* and *bad luck*." The causes for the apparently opposite results of attempts at cultivating this fruit, are worthy of investigation. They, of course, exist, and their discovery may result in rendering future attempts successful beyond a contingency.

The *first* query naturally presented, is: Why was the first stock of pear-trees, reared in Connecticut, Ohio and Michigan, thus thrifty and healthy?

Two causes operated mainly in producing such an effect. 1st. The trees were reared exclusively from seed. 2d. The superficial virgin soil, in most localities, was rich in the accumulations from decaying vegetable and animal matters during thousands of years.

By reference to Professor Emmon's Analysis, published in the *Horticulturist*, vol. II, page 300, it will be seen that the ash of the sap-wood of the pear-tree contains more than twenty-seven per cent. of phosphate of lime, twenty-two of potash, and a number of other inorganic elements.

It must be recollected that vegetables require their food as much as animals. If it be afforded in too restricted quantities, they will be both stinted in their growth, and predisposed to disease. Each must also have food of appropriate qualities. An absence of any one of the elements shown to exist in the ash of the pear, will render the tree unhealthy, and probably soon occasion its death.

In almost every virgin soil, the necessary food for the pear exists sufficient to ensure a rapid and healthy growth of one generation of trees. Cultivation of other crops, as well as the demands of the pear-tree itself, soon takes up most of those elements existing in the superficial soils, especially the phosphate of lime.

The *second* query is: Why have more recent attempts at rearing this tree been less successful than the first?

Two causes may be assigned. 1st. Suckers have been too commonly substituted for seeds in propagating this species of fruit, since the earliest generation of trees was produced in those several States. *Seedlings* are generally healthy—*suckers* never for any length of time. The circumstance of their springing from the roots is an evidence of pre-existing disease. That disease is sure

to be inherited by every sucker. Their growth may be rapid for a time, but is akin to the malignant developments which sometimes occur in the animal frame, and is sure to end in premature disease and death.

2d. The second cause has created a more extensive influence. I allude to the exhaustion or deficiency of the necessary organic elements in the soil. A knowledge of the limited amounts in which they occur in our ordinary soils, which have been injudiciously cultivated for a number of years, will show to any scientific horticulturist the impossibility of rearing the pear-tree upon them successfully. It is not a chamelion, which can live and grow fabulously by sipping wind. The young biped can not draw its mother's milk by sucking an empty bottle; nor the pear imbibe a solution of phosphates and potash from a soil made up exclusively of insoluble flint and clay. In localities where these requisite elements are furnished, but in too limited amount, this tree will exert its efforts mainly in producing blossom or fruit-buds in excess, which, of course, will prove abortive during the ensuing season from a want of food, and very little new wood will be formed.

On the other hand, if most of those elements abound, but the main one—the phosphate of lime—be absent, or in a restricted amount, the tree will often make a vigorous effort at forming new wood; the leaves will be luxuriantly developed early in the season, and the shoots will rapidly elongate with a spongy texture, till the period arrives for making a draft on the soil to furnish the necessary amount of phosphates, in order to mature the young and tender growths. This draft usually occurs in the hot and sultry weather of June or July, and is not duly honored. The result is, the delicate tissues immediately die, a rapid chemical change occurs in them, and it is said the tree died of the "*fire blight!*"

This disease is specifically distinct from the *frozen sap blight*, produced by the impression of frost, from the *canker blight*, often occurring in suckers, and from the *insect blight*, described in Dr. Harris' invaluable work on "Insects Injurious to Vegetation;" but is the *blight of innutrition*. The insect blight has occasionally appeared in Ohio on our pear, apple, medlar, quince and mountain ash trees.

A *third* query still presents itself: Why, in certain localities, has the pear-tree continued healthy, and endured to such extreme age?

To this may be replied, that some localities abound in their necessary food. The green sands and mass of the tertiary formations in New Jersey are rich in those elements. The debris of the trap-dykes, in some parts of Connecticut, contain them, especially potash in abundance; and there is little doubt that if the clays composing the banks of the Detroit river were analyzed, they would be found to contain more than a usual amount of the phosphates.

In some instances, this tree is sustained for a long period of time by the accidental supply of food. The dead carcass of some large animal may have been deposited near its location: a pile of bones, leached ashes, decaying vegetable matter, the refuse of a slaughter-house, or night-soil. Perhaps flocks of ducks, geese, hens or turkies make their roosts on or under its boughs for days and months in succession. From these and similar sources, phosphate of lime may be furnished. Pear-trees springing up in dense and neglected hedges are generally healthy, especially if they are the resort of quadrupeds and poultry.

In one instance I was familiar with a tree which attained an unusual size. It was standing near a smith's shop, and the owner for a long series of years had almost daily shod a large number of horses under its shade. The parings of their hoofs, as well as their adventitious droppings, contributed all the elements the tree required. Popular opinion attributed the effects to the iron-rust and cinders scattered from the shop. It was common to see the population in the vicinity placing loads of cinders about their trees, and encumbering the limbs with horse-shoes and sacks of old iron to "*keep off the blight.*"

Other collateral influences have favored these bi-centurians in certain localities. The pear-tree requires a rather moist and tenacious soil; not, however, wet and saturated with stagnant water. If placed on a loamy or clayey soil, abounding in the requisite inorganic elements, with pure water percolating beneath at a depth at which it can merely be reached by the extreme roots, this tree will be as hardy, strong-growing and durable as the oak.

Climate also exerts an influence over its health and prolificness. Contiguity to large bodies of water seems to temper the severity of the cold of winter, and prevents the occurrence of the *frozen sap blight;* and in summer the moist emanations prevent the scorching impressions of the sun, both on the foliage and fruit. Detroit and its vicinity are naturally furnished with the necessary requisites for producing this fruit on an extensive scale. Hundreds of acres of land might be advantageously employed for this purpose. If the population consult their own interests, and would develop the resources Providence has placed at their command, they will soon become the pear-growers of the nation. They might advantageously even ship, every autumn, thousands of bushels of the winter varieties to Europe.

All localities in our country are not naturally blessed as is Detroit, with the capabilities of rearing this fruit almost spontaneously. It is hoped that these views may not deter any one from attempting its cultivation in a judicious manner. The deficiencies which occur in most soils may be, to some extent, artificially supplied. Animal bones, urine, the sweepings of the poultry-house and yard, and guano, are the principal sources from whence the supplies must be furnished.

My own trees have been greatly improved, both in their vigor and productiveness, by burying about their roots large quantities of unground bones: time and weather break them down as rapidly as the trees call for supplies. The surface of the ground has been dressed with ashes and refuse lime. *Under this course of treatment I never had a pear-tree attacked with any species of blight.* This may have been accidental.

In conclusion, I would say that, in common localities, no one should set out one pear-tree more than he can annually cultivate with care, and can constantly supply, in some form, with the requisite food. A starved fruit-tree is of no more profit than a starved animal.

Experience may, perhaps, demonstrate that the super-phosphate of lime, manufactured under the superintendence of Prof. Mapes, of New York, is the cheapest and most convenient form of that element which can be employed. I have not yet tested its value.

A better taste should be developed among the fruit-dealers and fruit-purchasers in the markets of our cities. Some days since, I sent into market several bushels of Beurre Van Marum—a *third* rate, but yellow and showy fruit—and of the Beurre Bosc—*the best of pears*, in my estimation, but of a rusty and unimposing exterior—both were fully ripe. To the good people of Cleveland we must allow the credit of being the best judges of fashion and business operations, but can not honor their taste about fruits. The Beurre Van Marum sold readily from two to three dollars per bushel; while the Beurre Bosc would not fetch any price. My agent returned them, and my family soon learned to appreciate their value.

J. P. Kirtland.

East Rockport, Cuyahoga Co., Ohio, September 30, 1853.

[This letter was presented to the North-western Fruit-growers' Association.]

Choice Pears.

Eds. Horticultural Review and Botanical Magazine:

With your leave, I will offer a few notes on some of the *best varieties* of the Pear, as grown and tested on my grounds, the last and former seasons, with some remarks on the casualties attending the culture of the tree in our regions. I shall be brief on both points, but especially the first, as it is already too late to be of service to those who are making selections for planting this spring. It will, however, call the attention of others to observations during the fruiting season, the coming summer, and thus prepare their minds the better for fall planting. It is a notorious fact, that the mass of pears brought to our market are not worth the trouble of carrying home; much less are they suited for the dessert. I may be asked the question, why is this so? Tens of thousands of trees have been planted, of what the public have been told are the best sorts. In reply, I can merely say, the *eye* is the *chief* organ employed in the selection, not the *palate*. If a thing is only large and showy, it will sell. The better article is perhaps *small*, and not attractive to the eye, and is left unnoticed for the amateur and gardener, who, with their families and friends, luxuriate on it at home.

I speak from positive knowledge. There is no class of fruits equal to the pear, in varieties and luxuriousness, from June to

January. But they are not all large and showy. In order to have them through the season, if we want the best, we must be satisfied to have them with their size, and often with their less attractive appearance. I know of no more luscious pear than the *Summer Colmar*, and, at the same time, hardly one less attractive in its exterior appearance.

Before I proceed with my description, let me say, that long experience has fully proven that most summer pears are comparatively worthless when permitted to ripen on the tree, thereby being deprived of their fine juiciness and delicacy of flavor, which is always retained and developed when the fruit is taken from the tree by hand, before fully ripe, and ripened in the fruit room; from whence it can be taken as wanted, when fully matured; and I am sure no fine taste will ever regret the little trouble. But in this condition it is difficult to carry them to market; in fact, but few who go to this trouble wish to carry them there.

It must also be remembered, that almost all pears vary some in quality, in different seasons, in the same soil, from causes not fully known.

1. Doyenne d'Été.—A new and beautiful pear, of excellent quality for its time of ripening. Small, round; light yellow, beautifully washed and mottled on the sunny side with brownish red, sometimes quite bright. Flesh yellowish white, tender, juicy, sweet, and very pleasant. An early and good bearer; ripe middle to end of July.

2. Madeleine, or Citron des Carmes.—An old and popular variety, a little larger than the above, slightly pyriform. Yellow green. Flesh white, melting, abounding in sprightly juice, rather astringent. A great bearer. Ripe from middle to end of July.

3. Beurre Gifford, or Giffort.—A new and most beautiful little early pear; does well on quince stocks. Pyriform; skin smooth, beautifully mottled and sprinkled with distinct red on the sunny side. Flesh white, tender, juicy, sweet, and very pleasant. Ripe middle of July.

4. Beurre Benoist.—A new and exceedingly fine pear, always fine. Rather above medium size, obtusely pyriform; smooth and regular surface; yellow, beautifully washed and mottled with cinnamon on the sunny side. Flesh white, tender, buttery, abounding in rich, sweet, sprightly juice. Ripe last of July.

5. Julienne.—An old and well known variety, but none the less valuable for this. Below medium size; round, slightly and obtusely pyriform; always uniform surface, light yellow. Flesh white, buttery, sweet, juicy, and often excellent. An early and an abundant bearer. Ripe the first of August.

6. Tyson.—A new American pear. Medium size, obtusely pyriform, uniform shape; lemon yellow, with a dash of light red on the sunny side; very handsome. Flesh white, tender, melting, and buttery, abounding in sprightly, pleasant juice. Ripe middle to end of August.

7. Flemish Beauty.—A very fine and handsome pear. Large, round, obtusely pyriform. Flesh white, melting, sweet, juicy, and fine flavor. Ripe last of August. Tree, healthy growth and great bearer.

8. Bartlett.—A splendid pear, a well known variety. Large, irregular, pyriform; yellow. Flesh white, fine grains, buttery, and abounding in rich, sweet, highly-perfumed juice. A young and great bearer. Ripe the last of August.

9. Washington.—An American pear, below medium size; obtusely pyriform and flattened at the crown; light greenish yellow, often beautifully washed and mottled on the sunny side with cinnamon brown. Flesh white, melting, sweet, and abounding in rich, highly-perfumed juice. A young but moderate bearer. Ripe middle to end of August.

10. Stevens' Genessee.—A fine American variety; medium to large; greenish yellow; obovate round. Flesh yellowish white, tender, and buttery, sweet, with a little mixture of astringency, abounding in rich, fine-flavored juice. Tree vigorous, upright grower; rather moderate bearer. Ripe end of August.

11. Van Assene.—A new and fine pear. Size medium to large; round, flattened at the crown, obtusely turbinated. Greenish yellow, numerously covered with small russetty spots; at times beautifully washed and mottled with scarlet and cinnamon on the sunny side. Flesh white, juicy, melting, very tender, sweet, and often exceedingly fine. Ripe the last of August.

12. St. Ghislain.—A capital Belgian pear, which no one who is fond of a lively,

pungent, and brisk flavor, will regret to have in a collection. Small, pyriform, with quite a thick neck, which often narrows into the stem, so as to form part of it. Light yellow, at times with a scarlet wash, and mottled on the sunny side. Flesh white, tender, melting, and abounding in sprightly, rich juice. Ripe the first of September.

13. SUMMER COLMAR.—An unsightly, but exceedingly luscious and fine fruit. Medium size; round, rather flattened at the crown, and obtusely conical; at times quite pyriform. Generally quite green, becoming whitish at maturity, with occasionally a bronze on the sunny side. Flesh white, very melting, and abounding profusely in rich, sugary juice. Tree unsightly, rough and brittle. Ripe first to middle of September.

14. STYRIAN.—Supposed to be of English origin. A beautiful, showy fruit. Medium to large size; pyriform. Lemon yellow; often a brilliant scarlet wash on the sunny side. Flesh yellowish white, buttery, a little gritty at the core, very juicy, sugary sweet, with a slight mixture of astringency, perfumed and pleasant. Tree vigorous and healthy grower; an early fruiter. Ripe in September.

15. ZOAR SUPERB.—A fruit of great beauty and fine quality, of Ohio origin. Size large; round, but quite flat at the crown; slightly but obtusely turbinated. Clear yellow, with a beautiful scarlet cheek, somewhat shaded with light and dark streaks. Flesh white, tender, a little gritty at the core, abounding in sprightly, sweet juice, with a little admixture of astringency, but pleasant. Ripe in September.

16. DUCHESSE D'ANGOULEME.—A magnificent, large fruit, often first rate, but variable, and rather a moderate bearer; does well on the quince; of Belgian origin. Large; greenish yellow; obtusely pyriform, but irregular, and often knobby, with indentations on the surface. Flesh yellowish white, melting, buttery, and abounding in pleasant juice. Ripe the last of September.

17. SIEGNEUR D'ESPERIN.—A new, beautiful, and very superior fruit, of Belgian origin; much resembles, in size and form, the White Doyenne. Medium to large. Lemon yellow, with a light reddish brown cheek on the sunny side. Flesh white, tender, very juicy, remarkably sugary, pleasant, and finely perfumed. Tree healthy upright grower. Ripe in September.

18. KNIGHT'S SEEDLING, of Providence, R. I., (not that of England.) A beautiful and excellent fruit. Above medium size; round, but somewhat turbinated. Greenish yellow, with brownish cheek on the sunny side. Flesh white, firm, but smooth and buttery, abounding in sugary, sprightly, pleasant juice. Tree is vigorous, healthy and upright growth. Ripe in September.

19. SINCLAIR'S SEEDLING.—This is a small, but excellent fruit, originating at Baltimore, Md., much resembling in appearance and quality the Doyenne Gray. There is the same tendency in the fruit to crack, which much impairs its value. Ripe in September.

20. ONONDAGO.—A large and fine pear, originating in Western New York, bearing some resemblance to the Bartlett, but ripening somewhat later; therefore, valuable to succeed it, but not equal to that fine variety. The tree is of healthy growth, and is an early and good bearer.

21. GRASLIN.—A new fruit received under this name; large, and of exceeding excellence. In size, color, shape, and general appearance much resembling the Bartlett, but ripening a month later. It has few if any superiors in rich, melting, juicy, and delicious flavor at its season of ripening, which is the middle of October.

22. WHITE DOYENNE.—This old favorite occasionally resumes its pristine splendor; this was the case last summer, proving that it is not an exhausted soil that causes its deterioration. The cause is probably atmospheric. My specimens were very fine; we for many years have had nothing but cracked, unsightly fruit on the same trees.

23. BEURRE DIEL.—A large and fine fruit, often first rate, but variable. Round; greenish yellow. Flesh white, tender, buttery, abounding in sprightly, rich juice. Does well on quince stocks, but is best on its own roots; should be grown low, to prevent the wind from blowing the fruit off. Ripe October to November.

24. LOUISE BONNE D'JERSEY.—A remarkably fine pear, origin probably France. It succeeds finely on the quince, and is a young and great bearer. Size medium to large; pyriform. Greenish yellow, covered with brownish red, which sometimes assumes much beauty on the sunny side. Flesh

yellow white, melting, buttery, and abounding in rich, high-flavored juice. Ripe in October.

25. Beurré Basce.—Of Van Mon's origin—one of his best. Size medium to large; pyriform, sometimes quite long-necked, with a rapid expansion at the crown end. Greenish yellow, mostly covered with a mixture of rusty cinnamon, and sometimes a little red on the sunny side. Flesh white, melting, buttery, abounding in rich, high-flavored, sweet juice. Ripe in September and October.

26. Dix.—A good and handsome pear—origin in Boston. Large; pyriform. Lemon yellow. It surpassed my expectation in tenderness of flesh, and abundance of highly-perfumed juice and flavor, indicating its adaptation to our climate and soil. Ripe last of October.

27. Melia de Waterloo.—A new pear of great excellence. Large. Greenish yellow. Flesh melting, abounding in rich, high-flavored juice. Ripe the first of October.

28. Seckel.—A well known variety, of American origin, deservedly standing at the head of excellence among pears, though small and not very commanding in its outward appearance. Tree of slow growth, close and compact; perfectly hardy, resisting fire-blight; late in coming into bearing. Ripe in September and October.

29. Lawrence.—An excellent winter pear, of American origin. Medium size; obtusely pyriform. Greenish yellow, very uniform. Flesh yellowish white, firm, but smooth and buttery, abounding in sweet, rich, fine-flavored juice, which it retains to the last. It is decidedly the best early winter pear that has come under my notice, ripening well without extra care. Tree is healthy, a good grower, and an abundant bearer. Ripe from October to January.

Above I have only referred to such fruits as can be recommended for the dessert. Baking pears, and those of doubtful success in our climate, I will leave for a future article. A. H. Ernst.

Spring Garden, Cin., March 1st, 1854.

(To be Continued.)

It is sad to observe how many worthless trees are permitted to cumber ground, which might, at the same expense of culture, be occupied by those which bear choice fruit.

The Principles of Composition, as applied to Public and Private Buildings.

BY J. R. HAMILTON.

There is, perhaps, no art the scope and object of which are so little understood, and yet so prone to be criticized by the world at large, as that of Architecture. We speak advisedly when we say that there are many well informed and educated people, who scarcely know what the calling of an Architect means, and who imagine he has fulfilled all the requirements of his art when he designs a pretty front to a building. There can not be a more mistaken idea, for the services of an Architect are as much required, and frequently far more so, in the internal arrangement of a building than in its external decoration.

The end of Architecture is not merely to please the eye, but to administer to the comforts and convenience of man. Pleasure to the eye may, indeed, result from the useful combined with the beautiful modifications of which it is susceptible; and it is in this happy combination that the true genius of the Architect is exhibited. The art of decorating a well-proportioned edifice is a matter of comparatively little difficulty to the man of taste, whose mind is well stored with images of beauty; but the distribution and arrangement of the several portions of the plan, upon which every accessory is dependent, is frequently a matter of great difficulty, and requires considerable knowledge and experience on the part of the practitioner. In this is involved not only the general convenience and effect of the building, but, what is of much consequence to the proprietor, the *cost of the work*. None but those who are practically conversant with the planning of a building, would believe the amount of money that may be squandered or saved by the good or bad distribution of the different parts of a plan. When an edifice has many external *breaks*, for instance, much addition is made to the quantity of walling without necessarily increasing the convenience of the interior; while, at the same time, they destroy all breadth and simplicity of effect, by breaking up the masses into too many disjointed parts.

Luxury and richness of decoration, and the general striking appearance of a façade, seem to be the only source of pleasure to the generality of persons. "The fact is," says a pungent writer, "the number is very limited of those who can comprehend the plan of a building, or who, in walking over it, can so arrange in their minds the distribution of the several portions, as to have the smallest notion whether it has been skillfully composed or no. The spectator looks at the façade, connects it, perhaps, in an angular view with one of the flanks, says it is heavy and mean, or grand and magnificent, according to his taste or education; always excusing himself by admitting he does not understand Architecture, though he '*knows what pleases him,*' and we are certain he would be more suited for a judge if he had reason for the faith that is in him."

To please the eye is not, we repeat, the only object of Architecture. Public and private utility, the welfare and comfort of individuals, are the ends of the Art to which all other points must be sacrificed, and it is only when these have been accomplished, that decoration should begin. Those who make the internal parts of an edifice subservient to a mere façade, throwing out a turret here, and a jutting chamber there, merely to christen them afterwards, are literally putting the cart before the horse; sacrificing the purport of a building to its decoration. Such buildings always will have a forced and unnatural appearance; they never can please: while those which are the result of the more rational process of making the façade subservient to the internal parts, while the general plan and decorations are imposing and just, will always have admirers.

Ninety-nine times out of a hundred, it will be found that a good, useful, and natural distribution of plan, leads, with a little tact, to far better sections and elevations than could have been obtained by any other process of design. It is this peculiar feature which forms the chief beauty in Gothic Architecture, and without which, indeed, that exquisite style would lose one half of its richness and picturesque effect. The old Architects understood this thoroughly, and placed their windows, fire-places, &c., internally just where they would be most serviceable, letting them take their chance in the exterior. This accounts for those charming, varied, and picturesque combinations, to be found so generally, and, perhaps, only, in Gothic Architecture, (at any rate, to the same extent,) and of which it is difficult to convey even an idea to those who have not seen that truly majestic style carried out to perfection.*

This process of composition could not, of course, so well apply to such a rigid and impracticable style as the Grecian; but let the style be what it may, all practical men know that a required opening, coming in some unexpected and apparently difficult place, may frequently, by a little skill, be converted from a blemish into a chief beauty.

In a word, *distribution* and *disposition* are the first objects which should engage an Architect's attention, even where high decoration is his object; for no decoration will ever please, unless its source is directly traceable to the most convenient and economical arrangement of the leading parts.

It is impossible, in the space of an article of this character, to enter minutely into all the various features which should guide us in the composition of our town and country buildings. They are as varied as the whole range of individual taste and requirements, and it is seldom two buildings can be precisely alike. The accidents of site—the character of the surrounding scenery—the position of the edifice respecting aspect and adjoining buildings—the cost—and the peculiar wishes of proprietors, are but instances of many things which have to be taken into consideration.

In designing a building, whether for public or private uses, the first object of the Architect is, or should be, to make himself acquainted with the purposes for which the structure is intended. He must enter into the spirit which ought to pervade the building, examining and adjusting with care those qualities which are most essential to the end proposed. A church, a hospital, an observatory, a college, a school-house, should each have its distinctive features. Stillness and tranquillity should form the characteristic of our places of study—solemnity should mark those of worship—dignity those of state—gaiety and cheerfulness those devoted to

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* I purpose, in a future number, to enlarge upon this subject, when discussing the various styles most appropriate for our rural residences.

public amusements. The same mode of thought, the same process of reasoning applies as well to our private residences as to our public buildings, for they are subject to the same principles of composition, and the same elements are used in the formation of the one as of the other. By pursuing the course indicated above, the result can not, in the hands of any man of taste, fail to be pleasing and satisfactory. It is the course indicated by common sense, and is as important in the study of the art, as in the practical composition of designs; indeed, both are but an uninterrupted series of observations and reasonings, which have only to be systematized and judiciously put in practice.

Correspondence.

[We are kindly permitted, by the gentleman to whom it is addressed, to publish the following interesting letter, touching the Grape malady that is now ravaging the vineyards of France.—Eds. Rev. and Mag.]

Bordeaux, 14 Feb'y, 1854.

My Dear Sir:—Since my letter to you of the 19th of last October, there has fallen under my eye, two short but interesting works upon the disease of the Vines, a small portion of each of which I propose to translate and send you, believing that they will prove of value to those engaged in grape culture on the banks of the Ohio.

One is a Report, by M. Louis Leclerc, addressed to the Minister of the Interior, and officially published at Paris. The other is "Observations on the Maladie," written by Mons. A. Joubert, and is placed in my hands by Mons. P. F. Guestier, of this city.

These two authors are diametrically opposed to each other, as to the cause which produces this alarming enemy to the Grape. Mons. Joubert says, in opening the subject: "Though in winter, I thought I ought to make some researches, in order that I might know if there was a possibility of finding upon the wood of the vine traces of deposits of eggs or larva of small insects. I took then, for the first time, a microscope of great power. In looking under the strips of bark of the old wood, I could discover nothing; but, to my very great surprise, I perceived that the little points or spheroids, that I had remarked the preceding years on the new wood, were placed in the grooves of the bark, that they were round, and formed little spheres, and might well be called eggs." He then speaks, after a few sentences, "of the Acarus, or Vine Bug." "As I have already said, the young wood of the vine, on arriving at maturity, is more or less covered with little points very strongly resembling the eggs of insects, and showing, in the first months of spring, a depression upon one side in the form of a funnel, which would make one believe that an insect had gone out from it. This is only a supposition, for I have not *seen* insects leaving these spheroids. This would be a thing nearly impossible; but that which is not a supposition, is that, in the first days of the month of June, when the young branches of the vine had attained the length of thirty or forty inches, according to the vigor of the trunk, I perceived that some wounds and scars existed on the young shoots; that they were multiplied with a very great rapidity; and that already the leaves were lightly marbled: that is to say, they had some little yellowish spots, or spots of a green less dark than the ground of the leaf. I then began to make observations and researches still more minute and assiduous, and I was not long in discovering on the wood and on the leaves, an infinitely small insect, which I shall name, as my predecessors have done, the *Acarus*, or *Vine-flea;* this last name, perhaps, will be more suitable, for it jumps like a flea when never so little disturbed."

"This insect, which I am convinced causes the *maladie* of the vine, appears to form a family very various, of which each member, without doubt, undergoes several transformations, the same as the butterfly. * * * So soon as we perceive that the leaf is marbled, we can be sure of finding thereon the *Vine-flea*, a lively insect, which is constantly moving on the leaf and on the wood. On the leaf, it is easily discovered, though very small, by the naked eye. The insect is seen to cease its movements; it is then, without doubt, that it pierces the leaves for its sustenance. On touching it with a blade of grass, it jumps with a movement so sudden that it is impossible to follow it with the eye. Very often it falls to the ground, whence it soon climbs again upon the vine." "This *first* insect has the form of a louse, the hind part pointed, and the eyes very

big for its size; they stand out from their sockets in a very prominent manner. Its color is of a pale green. Whenever one finds this insect, he is *sure* to see some young shoots of the vine which, if they have no scars, are spotted or stained black. In examining these spots with care, there will be perceived, stuck together, some little eggs, free of color, and of a transparency equal to the most beautiful rock crystal. The biggest are not larger than the head of an ordinary-sized pin." "These eggs, I think, give birth to a new insect, which has exactly their form and transparency, and differs only from them because it is animated and endowed with an extraordinary vivacity. * * At the flowering season of the vine, two new insects make their appearance. One of the same color as the first, having similar eyes, and is furnished, moreover, with wings like those of a diminutive fly. The other, winged also, is distinguished from those which precede it, by a more elongated form, and by a different gait: thus, when it is perched upon a leaf where it is easy to observe it, it seems rather to roll than to walk: that is to say, instead of going forward or backward, it moves sideways, running over the leaf in *all* directions, with great rapidity. I should not be surprised if this is the insect which forms the web or net-work, which is spread on the leaves and berries of the grape, and which M. Fléchet has named the *Acarus arachnoides*."

M. Joubert describes still a fifth insect, belonging to the same family, and says also, that this class is invariably accompanied by excessively small spiders, constantly making their web, and thus, to a large extent, destroying the vine-flea. The whole of M. Joubert's little work is interesting, and, although I differ with him in his conclusions, would send more extracts, but I hope, in the short future, to send you the whole of it. There are many of the best vine-growers that think M. Joubert has hit upon the true cause of the disease of the vine, while others totally reject it, and adopt the theory of M. Louis Leclerc. I lean to the latter, for the cause, as given by him, seems to be adequate to the terrible effects produced.

In company with M. Leclerc's Report, are five plates, containing colored drawings of the disease in its different stages, as seen through glasses of a high magnifying power. But I will proceed to give you the extracts promised. As to the origin of the maladie, he says: "It was in the spring of 1845, that the maladie was observed for the first time, at Margate, in England, in the *forced culture* of Mr. Tucker, who usually is first in market with his productions. This efflorescence, of a grayish white, which covered the bunches of the grapes in the hot-house, was not long in showing itself in nearly all English establishments of the same kind. The Rev. Mr. Berkeley, of Bristol, an eminent naturalist, to whom was submitted some diseased grapes for inspection, recognized an *Oïdium* of a new variety, which he named *Tuckeri*, with the laudable intention of honoring the horticulturer of Margate. This oïdium forms a particular class in the immense family of Mushrooms; little mushrooms, in fact, which show simple filaments, or very fine branches, transparent, joined together by tufts, of which the heads compose so many seeds, which develop themselves successively, becoming detached and falling at maturity."

"Nothing positive is known as to the precise epoch in which the winds had thrown the *spores* or seeds of the *fatal* oïdium across to the continent, but a circumstance worthy of note is, that it was seen in 1847, *at first*, in the forced cultures in the environs of Paris, from whence it soon passed to the trellised vines, as it had done in England. Probably, though, the parasitical plant installed itself in several vineyards prior to 1851, but feebly; and it is to this last period that the disease took such *frightful* proportions in the south and south-east of France, in Italy, and in Hungary. As late as the 15th of July of that year, the largest vine-growers of the Bordelais did not believe in the existence of the disease, but now it has *crossed the Mediterranean*, fallen upon Algeria, and is in Syria and Asia Minor; light as yet at the greatest number of points, but terrible in many very important vineyards. The disease is on the Loire, the Charentes, all through the Bordelais and Medoc, in the Lower Pyrénées, the high Garrone, Languedoc, and, in fact, all over France and vine-growing Europe. The simple *vigneron*, from the Atlantic to the mouths of the Rhone, firmly believes that the disease is the effect of a "bad air," of a "wicked fog," of which he knows the precise

date. From Lyons to Dijon, and in Strasbourg and Metz, it is quite another thing. The people attribute the maladie of the vine to the lighting of the street gas, or to the escape steam from the railway locomotives. Either will serve: Satanic inventions both, giving birth to *other* cotemporary scourges."

M. Leclerc thinks that the disease will run its course amongst the vines throughout the world, and if his theory is correct, I see no reason to doubt it. If the seeds produced by these infinitely small mushrooms can be wafted by the wind across the British Channel, and across the Mediterranean, why not across the Atlantic also? If not already in your vineyards on the Ohio, you may look shortly for a foray made by these unseen enemies of the grape, and which all the talent of the vine-growing countries of Europe are diligently seeking to avoid, or to destroy after their attack.

Thousands of things are suggested as a cure for the maladie, but not one has yet proved of any value. The disease, like the cholera, pursues its course with unrelenting severity, and no obstacles employed by vine-growers has abated its malignity in the least. There are monthly meetings of vine proprietors here in Bordeaux, to discuss this matter; and so great is the alarm, for fear of the total loss of the vine, that money rewards, and gold medals of a large value, are offered for the discovery of a curative or preventive. I see the Spanish government has just offered a reward of frs. 125,000 to the fortunate discoverer of an antidote for this *sickness* of the vine. If you, in the Ohio valley, were to have your corn and wheat crop destroyed in the course of three or four years, you would be nearly in the position of the wine-growing countries of Europe. Starvation stares thousands of the smaller proprietors in the face, if the next crop should prove even as disastrous as the last two.

To the people of this region, wine is as much a necessity as bread. The mass of the laboring poor, in fact, live upon these two articles. The price of the former has nearly quadrupled itself within three years, and the largest portion of the poorer classes have had to give up its use. I will give you an instance of how universal it is as a drink amongst all classes and *ages*. Immediately opposite to my chambers, on the edge of the Jardin Public, is a fine large stone building, surrounded by alders and Lombardy poplars. This is the free school of Bordeaux, for girls between the ages of seven and fifteen; and here, every morning, at 8 o'clock, I see assemble from two hundred to two hundred and fifty children, all with white cotton caps and wooden shoes. I observed that each one of these little chatterers bore on her arm, when going into the building, a nice covered willow basket, about eighteen inches long, and from eight to ten inches in depth and width. This basket I thought was rather large, only to hold a child's dinner, and the few books they are here allowed to have; and thus my curiosity became excited, and I resolved to learn the contents of this mysterious pannier. At the period of recess for the school, I stepped out on my balcony, and saw the whole school, in noisy glee, under the shade of the fine old trees, every girl with her basket beside her, a large piece of bread in one hand, and a bottle of claret in the other; the glass glistening in the rays of the sun, as they frequently and lovingly applied the bottle to their mouths. Ah, thought I, that large basket was not brought to school so affectionately every day for nothing; it is just the thing to hold a book, slate, piece of bread, and bottle of wine.

Upon inquiring, I found that each girl has her bottle half filled with claret, and then filled up with water, which is all she has to drink during the day; and this quantity she brings every morning to school. Many in our country would think this led to intemperance, but it does not do so. No people are so free from it, that I have been amongst, as the French, and no people so habitually use wine. But to discuss the reasons why the French are so temperate, and the Americans and English the reverse, would lead to a comparison of the constitutional temperaments of the two people, and this I dislike to attempt on a cold day, and by the side of the small fires they have here in France. The climate is not cold, but they serve to make it equal to Nova Zembla, by the want of comfortable doors, windows, and fires.

I am, sir,

Very respectfully,

S. L. K.

R. BUCHANAN, Esq.

The Pear Blight.

[The following interesting paper was prepared for, and read before a recent meeting of the Cincinnati Horticultural Society, and we are gratified to be able to present it to our readers. The author's views, drawn from many years' careful observation, will arrest attention, even from those who do not agree with his conclusions. The facts he relates have an important bearing upon the question, and suggest to those interested in its solution, more careful experiments, and more extended observations.—EDS. REV. AND BOT. MAG.]

PRESIDENT OF CIN. HORT. SOC.:

DEAR SIR:—The Pear is now esteemed as one of the indispensable luxuries connected with a suburban or country residence. It is, therefore, not only important that the amateur and the novice should have information on the character and relative value of the fruit, its time of ripening in our climate, that he may select judiciously, but that he should also be somewhat informed on its adaptation to soil, and its cultivation, with the necessary care to protect the tree against the vicissitudes of climate, and the maladies to which it is subject.

The tree is not a native of our country. It is said to be of Europe and Asia, where it lives to great age, and grows to an immense size, with other native trees. In that condition, it is hardly recognizable as the parent of the present luscious and high-flavored fruit, but is small, austere, puckery, and unfit for the palate. It is to the skill of cultivators, that we are indebted for this great change and improvement in its character; and to none so much as to the late Van Mons, of Belgium. Chance or accident have not been idle in the work of adding many excellent varieties to the list. But the improvement of the fruit has (though not always,) been at the expense of the hardiness and durability of the tree. This point has been too much overlooked by propagators; its tenderness being seen, scientific cultivators are giving more attention to correct it in their future additions.

The cultivation of the tree is very simple; it readily adapts itself to almost any soil or location, so that it be not a swamp or marsh. A deep, rich, clayey loam, with a porus sub-soil, and a full exposure to light and air, is the best for its full development. The tendency of the tree is to throw down strong tap-roots; it is, therefore, important to know something of the nourishment it will find to feed on there. This tendency is overcome by growing it on the quince, the natural disposition of which is to spread its roots, and luxuriate on the surface soil; though the tree is dwarfed, and the duration of its life shortened, still it is better for shallow soils, and gardens where not much room can be afforded. The fine sorts, with few exceptions, succeed well and produce abundantly on the quince. These are usually trained in pyramid form, branching from the ground up, making a very handsome and attractive object in the border. When grafted or budded on their own stocks, they require more room, and are usually longer coming into bearing.

The cultivation of the tree has, however, its drawbacks. It is not hardy; or, if you do not like the term, it is subject to be cut off and destroyed by death at any time, when seeming in full vigor of health and growth. On the cause, there has been much speculation, without seeming to come to any satisfactory conclusion.

Long experience, observation, and much reflection, have established in my own mind the cause. I do not know that I can make this clear or satisfactory to you, and other minds, but I may open a door to a new, or rather an unexplored field for thought and reflection both to the practical and the scientific investigator. Perhaps there is no spot in this, or any other country, where a greater opportunity has been afforded for an observance of the diseases to which the pear-tree is subject—especially that form which we understand as *Fire blight*—than here.

Scientific gentlemen, with some exceptions, have generally followed each other in attributing it mainly to INSECTS, and some to an *exhaustion*, or *absorption* of those *particles* from the *soil* which are *essential* to the *health* and *life* of the *tree*, and the *perfect development* of its *fruit*, admitting, at the same time, the existence of other extraordinary causes for its disease and death.

Without denying that insects are sometimes injurious to the pear-tree, even to its destruction, I must be permitted to question the general correctness of the theory, and

also that of an exhausted soil. To my mind, facts do not warrant such conclusions, as applicable to our region. To make out the latter theory, it should not be left to rest on doubtful speculation, but it should be shown to harmonize with matters of practical fact, as they continually occur. The ingenuous mind never should allow itself to lose sight of these.

Though, unquestionably, the working, or grafting on bad stocks, such as *suckers*, and planting in *bad soil*, will facilitate the destruction of the pear-tree—as the same cause would any other—they are only *local*, and *lay* not at the *root* of the *evil*. To suppose the adventitious existence of some substance in the soil, to remove difficulties out of the way of a favorite theory, is not satisfactory.

It has been advanced that the cracking of the White Doyenne is owing to an exhaustion from the soil of those particles necessary to its perfect development; that the tree would resume its former habit of the production of perfect fruit, if these substances were supplied to the roots. Among many reasons for dissenting from this position, let me say, that for eight or ten years, I have hardly had a perfect fruit on trees of this variety, many of which formerly bore fine fruit, until last summer, when, on all of them, it was as fine as I ever saw it any where; and this without any application whatever to their roots. The trees are scattered over my grounds; some in grass, the sod of which has not been disturbed for years. I attributed this remarkable effect to atmospheric influences—with which the composition of the soil had nothing to do. It was, during the growth of the fruit, unusually dry for our climate.

Let us now examine the analysis of the pear-tree, as a correct and reliable basis to overcome the malady to which the tree is subject. Loudon and other eminent writers on the subject, would have us to understand that there is a strong analogy in the life principle of plants and animals. It is, therefore, fairly inferable that, as animals of the same species do not wholly depend on one class of food for life and health, but that, to a certain extent, choice is left to select from, producing the same results, that this is equally applicable to plants. When we, therefore, have the analysis of Prof. Emmons before us, showing that the ash of the sap-wood of the pear-tree contains more than twenty-seven per cent. of phosphate of lime, twenty-two of potash, and a number of other inorganic elements. Though perfectly correct, are we sure that a tree grown in a different soil will not produce different results? I shall show that this is the case in other species of trees, and, therefore, infer it is so with the pear. It is very certain that the color of fruits is affected by substances in the soil and taken up by the roots, not essential or detrimental to the health of the tree.

Liebig, in speaking of the inorganic constituents of plants, says: "Many of the inorganic constituents vary according to the soil in which the plant grows," &c. Again, "Most plants, perhaps all of them, contain organic acids of very different composition and properties, all of which are in combination with bases, such as potash, soda, lime, or magnesia," &c.; and after proceeding to show that certain acids are always, of necessity, present in plants, he proceeds: "It is equally certain that some alkaline base is also indispensable in order to enter into combination with the acids." And, while he seems to make it clear that the life and health of the plant depends invariably on certain acids, he says, "It will be necessary to bear in mind that any one of the alkaline bases may be substituted for another, the action of all being the same." His object is, if I understand him, to prove that certain acids are in the first place essential to the existence of the plant, and that this always attracts a given quantity of alkaline; that these alkalines are not necessarily the same, but similar in action; that the plant will take them up as they are found in the soil. To prove this, he says: "It has been distinctly shown, by the analysis of D'Saussure and Berthier, that the nature of a soil exercises a decided influence on the quantity of the different metallic oxydes contained in the plants which grew on it; that magnesia, for example, was contained in the ash of a pine-tree grown at Mont Brever, whilst it was absent from the ash of a tree of the same species from Mont La Salle; and that the proportions of lime and potash were also very different." Again he adds: "Let us now compare Berthier's analysis of the ash of two fir-trees, one of which grew in Norway, and the other in Allerard,

(departemens de l'Isere.) One contained fifty, the other twenty-five per cent of soluble salts; a greater difference in the proportion of the alkaline bases could scarcely exist between two totally different plants."

Though it seems in all cases the oxygen was found nearly in the same quantities in each species; proving conclusively that while certain properties, such as some of the acids and oxygen, are always present in nearly uniform proportions, that it is not so with other substances; that they not only vary largely in quantity, but in some instances are altogether absent; that a tree, like an animal, has some latitude of choice in its food; and that the elements of the air are essential to the existence of both. This is perfectly in harmony with every day's experience of the different and diverse soils we find the tree to grow and flourish in. It may be questioned, if a tree, which finds the proper constituent particles in a soil for its healthy growth, can ever exhaust any part of it to such an extent as to produce death, if the natural sources of growth continue to yield their supply from the atmosphere. A forest does not wear out the soil and die; on the contrary, we are indebted to its agency for the virgin soil we find under its boughs. It is the opinion of writers of high authority, that among our modern forest-trees, there are some which have attained the great age of four thousand years; and it is said, that "investigation of coal and lignite strata has proved the existence of trees of the same order as those now existing." If this be true, it proves positively that trees do not draw on the soil, so as to destroy themselves, or to impair the perfect development of their seed and fruit. But it may be said, this is applicable to a state of nature. Well, this is just what I am endeavoring to show: that we have run contrary to this; and, from that cause, have produced an enfeebled race, which we are exposing to an uncongenial climate, and charging it (improperly, as I think,) to the soil.

The reason why soils are worn out, is because of injudicious cultivation, a continued removal of its products without a proper restoration of the properties thus removed. This is not applicable to trees, only so far as the removal of fruit is concerned, and the obstruction of the natural supply from decayed leaves, branches, &c. This may be larger or smaller, and of course it is wise to see that the soil is well supplied with all the particles thus drawn from it. You may, however, feed the pear-tree as much as you please, and still it will die in the midst of a luxuriant growth; and it is, therefore, to other causes that we must look for its destruction, not to the want of proper food.

The advocates of the insect theory have not been very successful in proving its truth. They are bound to show something more plausible for its support, than the simple fact that insects are found in connection with the diseased parts. They are bound to show that these insects are really the cause, and not there as a result of the blight. And, moreover, to show some reason why it is that they *discriminate*, pass by certain unmolested pear-trees, and do not make a clean sweep of all within their reach; and also, why it is that their destructive influence is sometimes suspended for years together.

Prof. Harris' description of the *Scolytus Pyri*, in his invaluable work on Insects, which is mainly relied on as the support of this theory, fully defines its regular periods of change and operations. I am very sure that it will not apply to our blight, all the reasons for which I can not here enumerate. Suffice it to say, that the injury of that insect "*ends* with the death of the *branch*, down to a certain *point*, but does not extend below the seat of attack, and does not effect the health of other parts of the tree." (Second edition Harris' Treatise on Insects.) A comparatively harmless insect, whose effects all cultivators in this region will have observed on their trees.

I will here very briefly give what I deem the cause and the reason for the blight, which are not materially different from those given elsewhere. Long observation has confirmed my judgment that the disease is chargeable mainly to atmospheric influences. The Great Creator has, in his wisdom, so ordered it, that the vegetation, soil, and climate of every part of the globe act in perfect harmony, for the best development of the former. A departure from this state of nature is at the hazard of the health and longevity of the plant or tree, though this result does not invariably follow. The pear-tree, as before observed, is not a native of this continent, but of a different hemisphere,

where it grows to large size and great age, as other forest-trees do. All intelligent writers, so far as I know, are agreed that the improvement of the fruit has generally been at the expense of the hardiness and durability of the tree, (not a necessary consequence.) However, we find it so. We have imported an enfeebled race, and are exposing it to a new climate, the vicissitudes of which it is not fully capable of resisting. I care not for terms: whether you call it *Frozen Sap blight*, or *Sun blight;* whether the effect is produced by sudden and rapid changes of winter temperature, or an excessive summer sun. In either case, it is the destruction of the natural functions of the tree, producing disease and death. The former is often tardy in its work, but the latter generally rapid and instantaneous. In the one case, it is brought to bear on the tree in a state of rest, when the sap-vessels are contracted, when their juices have been expended to form wood, which is immaturely ripened. In the other case, when the sap-vessels are extended to their utmost capacity, to supply the demands of a rapid and luxuriant growth; when this growth is in its most tender and delicate condition, the scorching mid-day sun does the mischief; the sap, by its rays, is scalded and vitiated, a chemical process of decomposition takes place, its poison is soon carried to and mixed with other portions of the tree, and the whole is often irretrievably lost in a few hours. The only remedy is, the moment that it is discovered on the limb, where this form of blight always makes its appearance, to lop off until you come to the sound and healthy wood, and thus prevent its spreading. Do not stop to hunt insects, until you have performed this work, when you can do so leisurely.

Sun blight, or *Fire blight*, is always most prevalent in a wet and hot summer. There has been but little the last three years, and we shall certainly have no frozen sap blight to complain of next summer. This is to be attributed to rather unusual dry summers during this period; the wood having ripened well before winter set in, and the growth not so luxuriant as in wet seasons.

As a remedy, or rather a preventive to the frozen sap blight, I would suggest the shortening in application, in September or October, to check the growth, and induce the maturing of the wood. This system is, perhaps, only applicable to dwarfs, as standards can not well be reached. What is understood by shortening in, is to cut back the present year's new shoots to the firm wood, say one third or one half of it, as the case may require, so that the sap remaining shall be expended in perfecting the wood which is left, and not be stimulated by the leaves on the ends of the shoots to continue growth. This system is also practiced to force the tree into forming fruit spurs, and thus facilitate the production of fruit. Care must be observed in the time of performing this operation. It must not be so early in the season as to cause the bursting of the lateral buds, and thereby cause a more injurious growth than it is attempted to check. There need be very little risk in this; we must be governed by the state of the season. It is better a little late, than too early; when the majority of the leaves on the shoot are rigid and hard, is a suitable indication of the proper time.

Having said so much about the want of hardiness of the tree, it may be asked, how I account for the trees that are to be found up and down our land, which have withstood the winter's storms and summer's heat from one to two hundred years? Before I answer the question, allow me to offer them as standing monuments against the exhaustion and insect theories. We have had some specimens in this vicinity—until the spirit of city improvements required their room, when the rude hand of the woodman brought them low—whose existence was coequal with the first impress of civilization; they remained sound, healthy, and fruitful to the last. Such specimens, it will be found, have all originated from seed, and always from a hardier stock than the varieties of more modern introduction. A friend has just given me the history of one in Guilford, Conn., which he says is over two hundred years old, measuring fifteen feet in circumference at five or six feet from the ground. It is now beginning to decay, but yields a considerable quantity of fruit. He says the fruit does not compare with the best now in cultivation, but when he was a boy, more than fifty years ago, it was considered very superior.

It is to these hardy remains of ancient days, we must look for constitutions to

hybridize with our finer sorts, say, if you please, the Seckel, which is as hardy as any of them, for a class of trees producing superior fruit, and, at the same time, such as we can trust out of doors.

I fear the above remarks may seem to some lengthy, but the subject is of too much interest to be passed over lightly, or with mere assertions. As it is investigated, the more fully its importance is brought to view. I have endeavored to avoid all improper allusions, unnecessary repetitions, and aim at display; simply confining myself to a plain statement of theories and opinions of others, their comparisons and plausibilities. Much might be added to sustain the views I have presented as the real cause of destruction of our pear-trees.

Very respectfully yours,

A. H. Ernst.

Spring Garden, Cin., March 11th, 1854.

Entomology.

BY PROF. S. S. HALDEMAN, COLUMBIA, PENN.

Among the sciences which have a collateral bearing upon agriculture, none is more important than that which relates to insects. These constitute the largest division of the animal kingdom, and as the greater part of them live upon vegetable substances, they are continually interfering with cultivated plants. Thus, different insects attack respectively the roots, stem, bark, leaves, blossoms, fruit, and seed. Sometimes the same insect is destructive to several plants; and sometimes the same plant is infested by several insects; whilst the larva and adult of a single species frequently infest distinct plants, or different parts of the same plant: as the root, when a grub; and the leaves or blossoms, when adult.

The long-snouted insects, which include the weevils, chesnut worm, plum weevil, pea-bug, &c., include eight thousand distinct species, known to entomological science; and of these, upwards of three hundred belong to the United States. In general, the habits of each species, the districts they inhabit, the plants they infest, the periods of their growth and appearance, and their enemies, differ somewhat; so that there is room for a wide range of observation, with a view to prevent the ravages of such species as are found to be destructive.

From the small number of original observers, our knowledge of the subject, with few exceptions, is taken from European books; and as there have been but few systematic attempts to figure our own species, the general reader can not have a clear idea of the subject upon which he wishes to inform himself; even with the aid of the best descriptions.

The shell-fish of Massachusetts have been well figured in Dr. Gould's book, published by State authority; whilst the useful volume of Dr. Harris, on injurious insects, remains without this important adjunct to its usefulness. The State of New York has devoted four hundred thousand dollars to an investigation of its Geology, Agriculture, and Natural History: yet the last broke down the moment the portions were exhausted which the public could get in other books, so that the portion of the fund which should have been devoted to an original work in the deep and useful department of entomology, was spent upon mere compilations.

In some districts, a fourth, half, or more, of the crop of wheat is destroyed by the Hessian fly; and in the Patent Office Report for 1849, page 9, it is estimated that in this country, the loss from the ravages of insects amounts to twenty millions of dollars annually. In some districts, the crops suffer from year to year; in others they are irregular, or appear for the first time, so that the preventive knowledge, which is acquired through a course of years in certain localities, has to be re-acquired through the laborious process of experience, when an enemy appears in a new locality;—and this is likely to come too late to allow preventive measures to be adopted. Thus the apple-tree blight appears as a white down, which might be taken for a small mass of loose spider web, or the cottony down of some plant, but which turns out to be the covering of a kind of plant louse. This down is so conspicuous and accessible, that but little time and care are required to crush the enemy beneath, and preserve the orchard from entire destruction at a later day, when the evil has increased to such an extent as to be unmanageable. Yet how few who form new orchards, pass the young trees under review, to ascertain whether they are not founding a colony which will prevent them from enjoying the result of their labor; although a hundred trees may be inspected in a day, and an examination of the young planted trees be made in the same period.

The vast tracts of uncultivated land in the United States, might be preserved for years from the ravages of many noxious insects, by subjecting seed and plants from old localities to a rigid inspection or quarantine, and establishing local nurseries from disinfected materials. By such means, the enemies of the apple, peach, plum, pea, and some grains, could be circumvented.

Entomologists are frequently blamed for not working more in a practical direction; that is to say, those who never owned an acre of land, are expected to devote

themselves to the preservation of the lands of others, as if geologists should employ themselves in discovering mineral deposits upon the lands of their neighbors. Most entomologists have other pursuits; and as very few of them have time to devote themselves to the entire range of study, it frequently happens that noxious species do not enter into the portion to which they devote themselves. Moreover, entomology, as a science, is one thing, and the application of the science, another, which belongs to domestic economy; yet its application is so important that it should not be left to the casual and unsystematic study of those who attend to it only when accident throws a subject in their way. The history of many species is neglected, because it would require the expense of plates,—an expense which is seldom necessary in writing for entomologists alone; these being able to understand a technical description, or comparison with an allied form, already figured in the systematic books. Individual zeal, unless accompanied by wealth, would not produce a work like the magnificent one by Audouin, on the insects injurious to the vine, published by the French government; or that of Ratzeburg, in three quarto volumes, on the insects which attack forest trees.

False views of the relations of science to agriculture and domestic economy will be held by any community, which has not called for even an elementary knowledge of nature, in the education of the young; and amongst whom those institutions are deemed the highest, where Botany is taught without plants, Geology without rocks, Surveying and Navigation without instruments, Hydrostatics without water, and Entomology without insects. Such a condition of education can only be remedied by the establishment of agricultural schools, where cautious observation, theory, and practice, go together; the pupil being educated to reason upon the complicated phenomena of nature, as they occur; that he may be able to apply their laws, when the occasions arise which require them. This would prevent apparently trifling circumstances from passing unheeded, which might have an important bearing upon the interests of the farmer.

Some of the States support normal schools for the education of teachers. These might be made the means of diffusing useful information among the population; but, unfortunately, they carry little with them calculated to interest or instruct their future pupils in the operations carried on in the great laboratory of meteorological, chemical, vegetable, and animal nature.

In fact, our entire system of education has been built up and monopolised by, and for, a very small portion of the population; those, for example, who study rhetoric, or how to talk, but do not learn to act; and who fancy that the details of logic will enable us to reason correctly. Pupils are taught to such an extent from books, and so little from observation, that in most instances they merely know that the book-maker knew certain facts, and the laws in connection with them,—as in Astronomy, where not one pupil in fifty has an idea of the motions of the planets, however fluently he may repeat his lessons. In a school book, the question, Why is vinegar *sharp?* is answered by stating that it has an *acid* quality, which is taken for an explanation, although *acid* (ACIDUS) is merely the Latin word for *sharp*—a "logic" which is quite characteristic of the "literary" education in vogue.

Columbia, Pa., December 17, 1853.

Sawdust for Orchards.

A year last fall I hauled a load of old rotten sawdust and threw it around my young apple-trees. My neighbor over the way, is one of those characters who plods on in the same old track that his father and grandfather did, believing that they knew all, and more too. My neighbor said if I put sawdust around my trees, I would surely kill them. He said he put manure around some of his trees, and killed them. I told him I would risk it, "any how."

I put fresh stable manure around one row and sawdust around the next; around another row I put leached ashes; and the remainder of the orchard I manured with well-rotted barn-yard manure, and in the spring spread it well, and planted the ground with corn and potatos. The result was, many trees grew very luxuriantly, but the trees where the sawdust was, grew the best, the bark being smoother and the trees had a healthier appearance. I will also state, that part of the orchard planted in potatos, grew greatly better than that part planted to corn. The soil was clay loam.—*Farmer and Visitor.*

ANOTHER monster exhibition is to be held at Cheltenham, England, in June of 1854, which, in addition to all kinds of Horticultural productions, will comprehend every description of implement or article manufactured, designed, taken from, or in any way connected with horticulture. A building is now erecting at Cheltenham, containing twenty thousand superficial feet of glass, to hold it in.

A NEW weeping willow, named Kilmarnock, or *Salix caprea pendula*, is offered for sale by Mr. John Dickie, of Kilmarnock, N. B., which is said to bear the same resemblance to the ordinary *Salix caprea*, that the weeping ash does to the common ash.

Hops.

The Wisconsin farmers have been turning their attention to the culture of hops. The crop is said to be a very profitable one, and can be grown without any very heavy labor. For farmers who are compelled to wagon their produce a great distance to market, there is a decided advantage in raising hops in preference to grain.

Hops are worth generally about twenty-five cents per pound, and by proper culture one thousand pounds can be raised to the acre. A load of hops, then, is worth from $250 to $300.

We believe that hops flourish well in this vicinity—at all events we frequently find them growing wild. It would be well for some of our farmers to try the experiment of their culture on a small scale, whereby they could test the profitableness of the crop without risk.

[The above is applicable to the west generally, as hops are grown largely in some neighboring counties, and also in Indiana and Illinois, and yield a good profit.]

The Radish.

Few vegetables are here cultivated with greater facility than the radish; it seldom commands notice in the pages of our periodicals, because every one is satisfied that there is no secret in its management—sow the seed and a crop will follow. This, however, will not hold good in all cases, and occasionally it is found that even this common root demands that certain conditions be fulfilled; for frequently the produce of the radish bed is not fit for use. It is one of those roots which are not submitted to the process of cooking, and for this reason it must be produced at table in a tender and crisp state, or it will be rejected. All such vegetables owe this quality to the soil in which they grow, and several other points in their treatment. To produce tender and crisp flesh in any vegetable, rapidity of growth or development is essential; the tissue of which the substance is composed, must be quickly formed, so as to attain its full size before the influence of the air and sun convert it into woody fiber, or at least so act upon it as to harden it. The radish then requires a light, loamy soil, so open as to permit the swelling of the bulb or root, and yet firm enough to prevent the sun from acting with too much force on them while forming. The soil must be rich enough to promote rapid growth, and yet not so highly manured as to induce greater development of leaves than is absolutely necessary, as by this means the size of the root would be diminished. A proper degree of coolness and moisture are the most essential conditions in the production of crisp and tender specimens. Stiff clay soil must be avoided; and during the latter part of spring and summer, a spot selected for the sowings little exposed to the mid-day sun. Sow moderately thin, as when too thick the crop is inferior. Give plentiful supplies of water at this season; and if the soil is not very rich, a little manure might be added with the water. Avoid special applications of fresh manure, as this would produce an undue proportion of leaves.

By attention to the selection of a loose and mellow soil, avoiding one too stiff or sandy, and care in the application of abundance of water, there can be little fear of a failure. In sowing the seed, it is necessary, when the soil is very light, to tread it a little. In very dry seasons, the roots will not remain long tender after arriving at maturity, and should therefore be drawn as soon as they obtain a medium size.—*Country Gent.*

Cause of the Fertility of the Plains of Babylon.—Gypsum beds, says Mr. Williams, stretch from four hours above Mosul, many miles down the river, furnishing by their yearly wash the richest possible deposit for the plains of Babylon, and fully accounting for the otherwise incredible reports of their fertility, as given us by Herodotus. For thousands of years, the Tigris has annually transported and spread this "dressing" over those regions free of charge, and were they now thoroughly irrigated, as in the days of the energetic Nebuchadnezzar, they might again be the granary of the world.

Stone-tree.—There is a tree in Mexico called the *chijol*, a very fine wood, which, according to a writer in the National Intelligencer, (W. D. Porter,) becomes petrified after being cut, in a very few years, whether left in the open air or buried. From this timber, houses could be built that would in a few years become fire-proof, and last as long as those built of stone. The wood, in a green state, is easily worked; it is used in building wharfs, forts, &c., and would be very good as railway sleepers, or for plank-road stringers.

The Crystal Palace at Sydenham.—The great snow storm which ushered in the new year, tested to an unusual degree the capabilities and strength of the Crystal Palace. No less than *fifteen acres* of glass roofing were subjected to the enormous weight of snow which fell for several successive days, and it has stood the strain without the slightest injury. It is now stated that it will not be opened to the public until June or July.

Popular Errors in Floral Nomenclature.

A Rose, it is said, by any other name would smell as sweet. We may not argue from this, however, that consistency, and accuracy, and unanimity, in the use of names, are of no importance. Every plant is entitled to its own distinctive name. It is a misfortune that by custom, in our language, and, indeed, in all languages, two classes of names are used to distinguish the plants with which most all lovers of flower-culture are familiar: the scientific, or Botanical name, and the common, or vulgar name. How much better would it be, were every plant known by but one name; and that, by the way, a simple and comprehensible one; aye, and a pronounceable one. As it is, a plant bears one name in the catalogues of the Botanist and the Florist, and quite another in the market and domestic garden; and often the terms used by the Botanist are unintelligible to the amateur, who requires the interpretation of a dictionary, to enable him to comprehend what the former is talking about. He discourses with warmth and learning about the beautiful points and characters of the Bellis, the Dianthus, the Tagetes, and the Antirrhinum; and his less scientific, but equally competent and appreciative neighbor, listens to him without interest or sympathy; though his love and admiration for his beautiful Daisies, and Pinks, and Marigolds, and Snapdragons, is no less than the other's, and may rather be more ardent and enthusiastic. This state of things may be regretted, but can not be avoided. The Botanist will have his names, and the people will have theirs. The endeavor must be to make the parties mutually understood.

People who have gardens and flower-pots, however, not only make sad work, frequently, with the technical terms and hard names of the Botanist, but they get things strangely mixed up, and amusingly confounded, even with reference to the class of names in popular use, and called in the books vulgar. How the errors in this respect have originated, and how they have crept into our common floral language, it is difficult to explain. It is enough that they exist. I purpose attempting to set some of them right, in a few short successive articles; selecting the instances at random, as they shall occur to me. I shall include many, the names of which, having been recently changed by competent Botanists, for justifiable reasons, are not yet come into popular use. Many books, still in use in classes and families, retain the former nomenclature; and the desired uniformity is thus hindered, and different portions of the community, and even neighboring flower-growers, are talking about the same thing by dissimilar and conflicting names. I begin with a familiar instance; one that involves a double error.

Hedyotis Cærulea.—This is generally called, in hand-books and catalogues, Houstonia Cærulea. The latter is the name given to it by Linnæus, in honor of an English Botanist, Dr. Houston. It was subsequently discovered that the characters of the genus did not differ from those of an older one, established under the name of Hedyotis, or Hediotis, as formerly written. Later authorities have, therefore, included the Houstonia in the former genus; and it consequently takes its name, Hedyotis; a word coined from the Greek, signifying *sweet-ear*. As illustrative of the confusion occasioned by these changes of names, it may be mentioned, that this plant, in its several species, is called by De Candolle, and many English Botanists, Anotis—*without ears*—and is described under this name in respectable catalogues, and especially in Don's Botanical Directory. Our plant will be found described then as *Hedyotis cærulea*, *Anotis cærulea*, and *Houstonia cærulea*. The first is the one adopted by Torrey and Gray, and must be adhered to for the sake of uniformity. This beautiful native plant is called, in various parts of this country, *Forget-me-not*. The appellation, however, was long ago appropriated by an entirely different plant, the flower of which does, indeed, bear some resemblance to that of *Hedyotis cærulea*. The Forget-me-not of our gardens, so long a favorite of lovers and poets, is, botanically, *Myosotis palustris*, of the natural family Boraginaceæ, or Borage family; while the Hedyotis belongs to the family Rubiaceæ, or Madder family, nowise related to the for-

mer. The true Forget-me-not is not a native of the United States.

Tecoma Radicans.—Another instance analagous to the last, occurs to me in the well known and very splendid native Trumpet-creeper. This will usually be found described, excepting in some recent books, under the name of *Bignonia*, the type of the family to which it belongs. This name was given to it by Tournefort, in honor of Bignon, a French Botanist. Jussieu, and some succeeding writers, have included it in the genus Tecoma, and by this name it is now generally designated. It is to be noted, however, that Lindley, in his last edition of the "Vegetable Kingdom," still calls it *Bignonia*. This distinguished and prominent English Botanist, being relied on in other like cases, should, perhaps, govern in this. Somebody, or a convention of somebodies, competent to the purpose, should have authority to correct discrepancies of this sort, and establish a uniform and consistent nomenclature for all the known species of plants; finally disposing of all conflicting synonyms.

Dicentra Cucularia.—Here, again, the books are at fault. The plant in question is the cream-colored, two-spurred flower, known on our native hills as the Dutchman's breeches. The true name is given above, though it will be found in many books and lists, written, by some Diclytra, by others Dielytra. The name is suggested by the shape of the flower: *dis*, two; *centron*, a spur. The sweet-scented species, whose flowers are somewhat differently shaped, and have a rosy tint, is the D. Canadensis, the wild Hyacinth of the country; by many called Squirrel-corn, from the small, corn-like, yellow tubers attached to its roots. This species is well-marked, and the flowers have a delicate hyacinthine odor, much prized by the gatherers of our vernal wild flowers. This plant is in some localities called Corydalis; but Corydalis is quite another genus, though belonging to the same family. Its flowers are smaller, the plant is taller, in one species, and more spreading and slender in another; and the flowers appear later in the season. This last, again, is frequently called Fumaria, or Fumitory. It is another error to do so. The Fumaria is not a native of this country. It is frequently seen in gardens, supported by sticks or brush, as it has a climbing habit, and its clustered panicles of small rose-colored flowers are much admired. It does not generally bloom till late in the summer. The Corydalis, mistaken for it, blooms in May and June. The Dicentra is one of our earliest harbingers of spring: blooming on or before the middle of March, according to the condition of the seasons.

Syringa Vulgaris.—I have a letter from a friend, making inquiries relative to some species or varieties of the *Syringa*. It is strictly true that I do not know what he refers to. I apprehend that he names one thing, and means another. The reason is this: the Syringa of the books and catalogues, is not the Syringa of common conversational language. I heard an amateur gardener, not long since, commending to another the *Syringa philadelphus*. It would have surprised him to have been told there was no such plant; yet such is the fact. The *Syringa*, correctly, is the common Lilac. There are three or four species, or rather varieties. The *Syringa vulgaris*, the familiar purple Lilac of our gardens; the *S. persica*, the Persian Lilac; the *S. alba*, the white Lilac. The last is very beautiful; but the most graceful and delicate, as well as the earliest, in this climate, is the Persian. These are all true Syringas; but there is another flowering shrub, equally common, that goes with many people by the name of Syringa. This is the Philadelphus, an entirely distinct genus. There are several species of this, also; but two are more familiarly known. These are the *Philadelphus coronarius*, a beautiful branching shrub, covered in June with a profusion of white, orange-like blossoms, delightfully fragrant with the odor of the Jasmin; and the *Philadelphus inodoratus*, less spreading, but equally beautiful, though destitute of the fine distinguishing odor of the other. The latter may be known, when not in bloom, by its leaves, which are entire, or not toothed, as are those of the coronarius. It is a misnomer to call these plants Syringa, the long established botanical name of the Lilac.

The confusion resulting from this misapplication of names, must be apparent to every one, even from these few examples. Is there any remedy for the evil? Most certainly. If every florist, gardener, and amateur would ascertain correctly the names

of the plants in his possession, or within his acquaintance, and use them on all occasions, and them only, to the exclusion of all others, however popular or customary, the erroneous ones would soon fall into disuse, and ultimately become forgotten. I shall pursue the subject in the next number. J. W. W.

Flowering of our Native Plants.—No. II.

FLOWERS OPENING IN APRIL.

Æsculus flava—Yellow Buckeye.
" glabra—Ohio Buckeye.
Aquilegia canadensis—Wild Columbine.
Arabis canadensis—Sickle-pod.
Asarum canadense—Wild Ginger.
Asimina triloba—Papaw.
Benzoin odoriferum—Spice bush.
Caltha palustris—Marsh Marigold.
Cercis canadensis—Red-bud.
Celtis occidentalis—Hackberry.
Collinsia verna—Early Collinsia.
Cornus florida.—Dogwood.
Cratægus coccinea—Scarlet Thorn.
" punctata—Spotted Thorn.
Delphinium tricorne—Wild Larkspur.
Dentaria diphylla—Toothwort.
Erythronium Americanum-Adders-tongue.
Fraxinus Americana—White Ash.
" quadrangulata—Blue Ash.
Geranium maculatum—Crane's bill.
Mitella diphylla—Bishop's cap.
Osmorhiza longistylis—Sweet Cicely.'
Phacelia fimbriata—Fringed Phacelia.
Prunus Americana—Meadow Plum.
Ranunculus fascicularis—Early Crowfoot.
Ribes cynosbate—Prickly Gosseberry.
" floridum—Wild Black Currant.
Sassafras officinale—Sassafras.
Scilla esculenta—Quamash.
Senecio aureus—Groundsel.
" " var. obovata—Ragwort.
Tradescantia Virginica—Spiderwort.
Trifolium repens—White Clover.
Trillium sessile—Purple Trillium.
" erectum, var. album—White Trillium.
Viola canadensis—Canada Violet.
" palmata—Palmate Violet.
" pubescent—Yellow Violet.
" striata—Pale Violet.
" tricolor—Wild Pansy.

Cincinnati, March, 1854.

(To be continued.)

The Fig.

Who remembers to have seen the blossom of the fig? I have seen many persons puzzled to understand where it was, and what kind of a thing it was. Others I have heard affirm that it had no blossoms. They see, pushing out from the axils of the leaves, a small, green button, presenting no appearance of a flower, developing no floral appendages, but gradually protruding and swelling, and daily increasing in size, till it arrives at maturity, and becomes a smooth, pulpy, pear-shaped fig. On no other part of the plant is there the appearance of any blossom, and they conclude hastily that it has none. We shall surprise such by the statement that few plants have so many flowers, in their season, as the fig-tree. On a full-grown and full-bearing tree, they are produced to an extraordinary and countless multitude. Humble and inconspicuous they are, to be sure, and modestly concealed from ordinary observation; but still as perfect in their parts, and as effective in their respective functions, as the many that outrival them in size and beauty, and attract our attention by their grace and brilliancy.

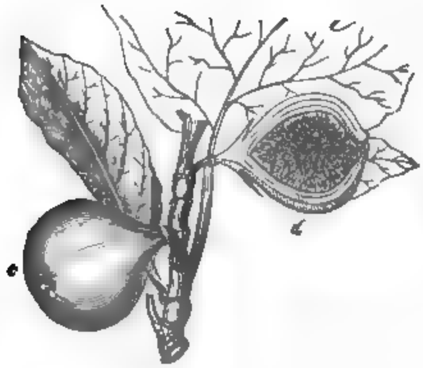
Every one is familiar with the inside of a ripe fig, and has observed the large quantity of seed it contains. But perhaps every one does not know so well, that each individual seed has had its own separate blossom. Furthermore, the plant is monoicous: that is, its stamens and pistils are produced on different flowers; consequently, great as are the number of seeds in a well-matured fig, and though each seed has its own flower, the blossoms of the fig-tree are greater in number than its seed, for the staminale flowers bear no seed. That these flowers have forms and consistent characters is seen by the following figures.

a b

The staminate, *a*, have a five-parted calyx, and three to five stamens, with bi-locular anthers. The pistillate, *b*, have a similar tubular five-lobed calyx, a superior ovary, a style, and two diverging, flexible stigmas; the ovaries are one-celled and one-seeded.

But where are these flowers? and why are they so difficult to discover? They are on the inside of the fig, adhering to its internal surface. The fig, in common acceptation, the fruit, as in the mulberry and strawberry, is the receptacle; but the flowers, unlike those of other plants, are attached to its inside; the receptacle is, in fact, with its closely crowded flowers, turned outside in, and in its internal cavity the minute flowers bloom unseen, and the seed ripen, imbedded in the mucilaginous, sugary pulp, with which it is ultimately filled.

This singular and interesting arrangement will be understood by a glance at the following figures:



c is an imperfect, unripened fig; *d*, a longitudinal section, in which the inner cavity is seen to be filled with the expanded flowers. The staminate occupy the upper portion near the external opening. This opening is surrounded by small, but very apparent scales, which may be regarded as bracts; they have been mistaken for remains of a flower, or the persistent calyx of one, supposed to have occupied the apex of the fruit. They have no more connection with the flowers than have the ordinary bracts of many plants, or the chaffy scales of the compositæ. The pistillate flowers fill up the lower and main part of the cavity, and become amalgamated and confounded with the sugary mass that fills the matured and swollen receptacle, as the fruit ripens.

The common fig is the Ficus Carica of Linnæus, and belongs to the family of Moræ, or Morus (Mulberrry) family. Its florescence and fructification I have described. It is a native of the south of Europe, and various parts of Asia, and is one of the oldest and most familiar fruits known to mankind. Its size is variable, according to the climate and soil in which it is grown. Its general hight is from 10 to 12 feet; its trunk is smooth and branching, the branches spreading at the top, numerous and stout. It has a milky sap, acrid to the taste, and becoming thick and gummy in drying. The leaves are large, alternate, rough, palmately lobed, and deciduous. The figs appear before the leaves; but to these succeed, at a later period, a second crop, which produces the best fruit. Cultivation, through a long period of changes and experiments, has given rise to a great number of varieties of this fruit, differing in size, flavor, and color. Several of these are peculiar to certain localities and climates, and can not be reproduced or imitated in any other. Others again seem to adapt themselves readily to different conditions of soil, and by artificial appliances and care, yield fruit abundantly, some sixty, and some an hundred fold. None of them, however, will endure continued or severe frosts.

J. W. W.

The Banana.

We have given, in our present number, (see frontispiece,) a characteristic and beautiful sketch of the Banana-tree, as it appears in its native habitat, and surrounded by some of the peculiar tropical plants that are its usual associates. The plant is one of the most interesting and useful that our prolific earth produces. It is a native of the tropics, and is also found in Japan, and at the Cape of Good Hope. It is of easy artificial culture, and in this climate, under glass, will thrive well, and produce its delicious fruit abundantly. The fruit is well known in our markets, the tree that produces it, perhaps, not so well. The description I am to give of it may, therefore, not be without instruction and interest.

MUSA SAPIENTUM, L.

Natural Fam., Musaceæ. *Plant Polygamous. Generic Characters.* Musa. Linn. Female flowers placed near the base of simple spadix. *Calyx* spathaceous, oblong, concave, large, many-flowered. *Corolla* unequal, ringent; upper segment erect, tongue-shaped, five-toothed; lower, a one-leaved nectary, heart-shaped, keeled, compressed, pointed, spreading, shorter than the upper. *Filaments*, six, subulate; five within the upper petal, erect,

short, without anthers; the sixth, within the nectary, twice as long as the others, terminated by a linear anther, attached by the middle. *Germ* of the *Pistil*, within the receptacle, three-sided, elongated. *Style*, cylindric, erect, as long as the petal. *Stigma*, rounded, obscurely six-cleft. *Berry*, fleshy, covered with a husky skin, long, obscurely three-sided, one side gibbous; internal pulp in three divisions, without partitions. Seeds mostly abortive.

The *male flowers* are placed above the others, on the same spadix, and are separated by alternate bracts. They do not differ from the female, excepting in the character of the stamens; the five within the upper petal have each an anther, while that of the sixth is abortive. These last perfect no fruit.

General Description. The plant has no true stem or trunk. The persistent, dilated, sheathing bases of the petioles of the fallen leaves, overlapping each other like scales, form a sort of false trunk, and support or surround the internal scape or peduncle that springs directly from the tuberculous root. This scape, or flower-stalk, having traversed the interior of the apparent scaly stem, is terminated by a fleshy spadix, supporting a large spike of flowers: these are very numerous, nearly sessile upon the tapering spadix, and rather verticillate; they are nearly covered with spathaceous imbricated scales or bracts, of a dull rufous color. The flower is composed of two unequal concave pieces, which enclose five or six stamens. The ovary becomes an oblong, three-celled berry or pepo, of the shape of a cucumber, assuming a bright lemon color when ripe. The fruit is very succulent, pulpy, and fine-flavored, and would contain, but for their general abortion, numerous crustaceous seeds. From eighty to a hundred of these *bananas* are produced frequently upon a single scape. The plant ranges in hight from twelve to twenty feet. The leaves are continually produced, during growth, from the extremity of the seeming trunk, which terminates in a gracefully spreading bundle of them. They are from six to ten feet in length, about two in width, and are smooth, entire, satiny, of a delicate pea-green color, and marked by fine parallel veins, extending from the mid-rib to the margins.

As may be judged from our print, the tree is a beautiful object in a landscape: its shining, light green leaves contrasting finely with the dark masses of a deeper tone that surround it. The fruit is universally esteemed grateful and wholesome, and is an important article of diet to the inhabitants of warm climates. It is eaten in various forms. From the dried pulp an excellent flour or meal is obtained, which is much used for making bread—considered palatable and nutritious. The fruitfulness of this plant is remarkable. It is said by Humboldt, that the same space of ground necessary to produce half a bushel of wheat, or ninety pounds of potatos, will afford four thousand pounds of bananas. The nourishment contained in the banana is surpassed by that of no other food.

That the banana is native to Cuba or other West India Islands, where it grows to such perfection, is much doubted by most Botanists. It has, probably, been introduced by early cultivators. It is at present a special article of cultivation in those islands, and also in Central America. The plants are of easy propagation. If a well-grown summer stalk is cut off near the ground, the root will immediately throw up several young shoots, which may be removed as soon as well set, and planted in low, rich ground, prepared for the purpose, where they soon take root and grow very rapidly. A piece of ground once planted in this manner, continues to produce fruit annually. The shoots attain their growth, twelve to fifteen or twenty feet, in one season; bloom and bear fruit, and then die down to the root, or are cut off by the planters. But several new shoots at once spring up from the same root, and run through the same course. A continued succession of fruit is thus obtained with a little management on the part of the cultivator. The shoots attain their growth and come into fruit in about ten months after planting, or after their first appearance from the remaining root. Their decay commences as the fruit begins to mature. The planters shorten the period, and hasten the production of new shoots, by cutting off the bunches of fruit before they begin to ripen. The bearing stalk is soon after cut down, and new ones at once spring up from the root. Meanwhile the fruit, hung up in any dry place, continues to mature, gradually changing its color from a bright green to golden yellow, and finally to a brownish black; which last color indicates advancing decay.

The plantain, less valuable than the banana, but much used in tropical countries, is the *Musa paradisica*. The species are scarcely distinguishable, excepting in the character of their fruit.

The banana is susceptible of stove culture in this climate, and may be made to produce fruit. One or two plants, of a new variety, may be seen in the stove of N. Longworth, Esq., of this city. Its culture can only be pursued here, however, as a matter of curiosity or fancy, though fine fruit has been produced from it in England.

J. W. W.

The Tea-Shrub.

BY PROF. SCHOUW.

The tea-plant is a low shrub, which when left to itself may attain a hight of 10 feet or 12 feet, but in cultivation generally grows only to 5 feet or 6 feet, in some places even only 2 1-2 feet to 3 feet high; it is kept thus low in order to make it push out more shoots, and to facilitate the gathering; it bears longish, lance-shaped, toothed, shining evergreen leaves, and flowers, in the axils, with a five or six leaved calyx, a six or nine leaved corolla of a white color, and numerous stamens. The fruit is a three-lobed capsule, with separate cavities; in each chamber there is one seed, with a hard nut-like shell. *Camellia* is the genus nearest allied to it. The tribe to which these two genera belong is called that of the Camelliese.

It is not yet fully made out whether there is but one, or are several species of tea, and particularly whether the green and the black tea are obtained from two different species or two varieties, or whether the difference between them depends merely upon the different modes of management; but at present most botanists, as well those who have been in the native country of the tea, as those in Europe who have examined the shrub growing here or dried specimens, are of opinion that all kinds of tea come from one species. The most active opposer of this opinion, however, is Reeves, the former tea-taster of the English East India Company in Canton.

The countries in which tea is grown are China and Japan. In the north of China, for instance near Pekin, the tea-shrub will live in the open air, but the tea is not good, so that it does not pay to cultivate it on a large scale. It is, in like manner, only in the southern parts of the Japanese empire that the growth of tea is important. But while too cold a climate is disadvantageous to the tea-shrub, the same seems to be true of a too warm one. In Tonquin and Cochin China, tea-growing is still met with, but it is not very extensive, and the product is not good; in like manner, most of the experiments which have been made to cultivate tea in the torrid zone, have failed. The extreme limits of the cultivation of tea in Eastern Asia, if we determine them according to where the tea-shrub thrives in the open air, are the 15° and 40° N. L.; but if we speak of the profitable cultivation, the zone is restricted between 23° and 31° (from Yunan to somewhat to the south of Nankin) in China, and between 30° and 35° in Japan. Toward the east, the area of distribution of tea is limited by the Southern Ocean; toward the west, it does not extend further than the limits of Thibet. In Assam, at 25°—26° N. L., and at a mean elevation of 2000–4000 feet, a wild shrub has been discovered, which Dr. Wallich recognized as the true (?) tea, and the cultivation of tea has been commenced there.*

Among the recent attempts to introduce the cultivation of tea into other parts of the globe, are those which were made in Rio Janeiro, where a tolerably large tract was planted with it, and Chinese colonists were brought to cultivate and prepare the tea; but the tea grown there is coarse and destitute of the delicate aromatic odor of the Chinese tea, and besides, the price of labor is too high; the Chinese have, therefore, gradually become scattered, and the plantation may be regarded as a failure.

The experiments made recently in Java (probably at some hight above the sea, in this mountainous country) have been more fortunate. Nearly 1,500,000 lbs. of Javanese tea are said to have been imported into Amsterdam in one year.†

The tea-bush is indigenous only in China, and, according to recent discoveries, in Assam, on the borders of China; not, however, in Japan, for the Japanese history mentions the Chinese bonzes who brought the tea-shrub into that country. This must have happened before the tenth century, (A. D.,) for mention was made of it in Japan in the commencement of that century. Perhaps it was in use even in the sixth century. The accounts of its cultivation in China go still further back. It is related that in the sixth century, a physician recommended it to the emperor as a remedy for the headache, and he is stated to have been highly regarded on this account; and even in the fourth century it is mentioned that a minister drank tea. A tax was laid upon tea for the first time, in China, toward the end of the eighth century. The Japanese have a myth respecting the origin of this important plant. A Buddhist saint, Darma, came from India to China, with the intention of spreading

* Also in the Himalayas, where it is likely to prove very important.—Ed.

† Meyen, Geography of Plants.

his doctrines in that country; to strengthen him in his mission, and to give distinction to his religion, he made a vow to pass night and day in uninterrupted religious exercises, but sleep at length overtook him. When he awoke, in anger at his fault, and in atonement for his broken vow, he cut off his eyelids, and threw them on the ground; but these grew up into a plant wholly unknown before, the leaves of which he tasted, after which he felt strengthened, and in a condition to withstand sleep better. He recommended this valuable plant to his disciples, chiefly with a view to the same ascetic purposes. It is evident at once that the myth contains a symbolical indication of the effects of tea upon the nerves. This Darma is an historical personage, who lived in the sixth century.

The tea-shrub thrives best on the south side of hills, and in the vicinity of rivers and brooks. It is cultivated in large or small plantations, where the shrubs stand in regular rows; but in Japan they are also found growing as hedges along the boundaries of the fields, for the domestic consumption of the owner.

The shrub is increased by seeds, and is cut down, apparently in order to make it branch sufficiently. In the third year the leaves may be used, and at the seventh year the shrub must be removed and replaced by a new one, to secure a good crop. Manure is applied; in Japan oil-cake is used, with dried sardines and the juice of mustard-seed.

The leaves are gathered at three separate times of the year: in February or March, when the delicate, scarcely unfolded shoots are picked; in April, at which time older leaves and new delicate shoots are gathered, these being sorted according to the delicacy of the leaves; and finally in May and June, at which season the coarsest leaves are removed, which, however, are likewise sorted. The first gathering yields the finest tea, ("Emperor Tea," in Japan,) and this is pulverised after being dried. The leaves are pulled off, each separately, either from the bush itself or from the branches carried home. If we may believe some accounts, there is a peculiar mode of gathering a certain wild kind of tea, which grows on steep, inaccessible cliffs. This gathering is stated to be made by monkeys, which are trained to it, or according to others, (less probably,) in the following way: the monkeys found on the bushes are excited by throwing stones, &c., and they then throw the branches down at the Chinese.

After the leaves are gathered, they are dried, by laying them in iron pans placed over a fire in little stoves. Great care is required to dry them without burning, and it is repeated several times. A man stands at each pan, turning the leaves over with his bare hand. Each time that they are taken from the pan, they are rolled in the hand, and in this way the tea-leaves acquire the form in which they are met with in trade. If this process alone is employed, it is called the *dry* way; the *wet* way is as follows: the tea-leaves are first placed in an iron sieve, and held over boiling water, the vapor of which rises into the seive, penetrates and changes the leaves, after which they are dried in the same way as before. According to some accounts, green tea is produced by the first process of drying, black tea by the second; but Siebold seems to have entertained the opposite opinion of the matter.*

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* Mr. Fortune, who has visited many parts of the Chinese coast, states that there are two species of tea-plant, *Thea bohea*, from which both black and green tea are made in the southern provinces; while *Thea viridis* alone is grown in the northern provinces, and in like manner constitutes the material for both kinds of tea; but, as Dr. Royle observes, it is quite possible that the Chinese may prefer varieties of the same plant, in particular soils and situations, for the preparation of particular varieties of both black and green tea.

The following is the account of the modes of preparing teas, by Mr. Ball, late inspector of teas to the East India Company in China:

In the manufacture of *black tea*, the leaves are exposed to the air, after gathering, so that they lose their natural crispness, and become soft and flaccid; they are kept in this state until they begin to emit a slight fragrance, upon which they are sifted, and tossed about with the hands in large trays; the leaves in each sieve are then collected into a heap, and covered with a cloth. They are then watched with the utmost care, until they become spotted and tinged with red, at the same time increasing in fragrance; they must be then instantly roasted, or the tea would be injured. In the first roasting of all black tea, the fire is prepared with dry wood, and kept exceedingly brisk; any heat suffices which will produce the crackling of the leaves described by Kæmpfer. The roasting must be continued until the leaves give out a fragrant smell, and become quite soft and flaccid, when they are in a fit state to be rolled. The roasting and rolling are repeated, often a third, and with large and fleshy leaves, sometimes even a fourth time; and it is only when juices can no longer be freely expressed in the process of rolling, that the leaves are considered to be in a fit state to undergo the final drying, in sieves placed in the drying-tubs, above a charcoal fire, in a common chafing-dish. During this process, they begin to assume their black appearance. A considerable quantity of moisture is dissipated, and the fire is then covered with the ash of charcoal, or burnt rice-husks, which both moderates the heat and prevents smoke. The leaves are then twisted, and again undergo the process of drying, twisting, and turning, as before; which is repeated once or twice more, until they become quite black, well twisted, and perfectly dry and crisp.

Of *green tea*, there are only two gatherings, the first about the 20th of April, the second at the summer solstice. The *green tea* factors universally agree, that the sooner the leaves of green teas are roasted after gathering, the better; and that all exposure to the air is unnecessary, and to the sun injurious. The iron vessel (called a *kuo*,) in which the tea is roasted, is thin, about sixteen inches in diameter, and set horizontally in a stove of brickwork, so as to have a depth of about fifteen inches. The fire is prepared with dry wood, and kept very brisk; the heat becomes intolerable, and the bottom of the *kuo* even red hot, though this is not essential. About half a pound of leaves are put in at a time; a crackling noise is produced, much steam is evolved from the leaves, which are quickly stirred about; at the end of every turn they are raised about six inches above the surface of the stove, and shaken on the palm of the hand, so as to separate them, and to disperse the steam. They are then suddenly collected into a heap, and passed to another man, who stands in readiness with a basket to receive them.

The process of rolling is much the same as that employed in the rolling of black tea, the leaves taking the form of a ball. After the balls are shaken to pieces, the leaves are also rolled between the palms of the hands, so

The dried tea-leaves are then either packed in this condition in stoneware jars or leaded chests, or they are made into a kind of cake by the aid of ox's or sheep's blood, or fat, (the *brick-tea*, as it is called, which is very extensively used in the north of Asia;) in the south-west of China, the tea also occurs in round balls, which are sent to Ava and Cochin-China. Sometimes sweet-scented flowers are mixed with the tea, for example, *Camellia Sasanqua* and *Olea fragrans;* but it is quite a mistake to suppose that the peculiar aromatic odor is due to these, and not to the tea itself.

The tea is bought from the producers by small traders, and brought by them to the great merchants in Canton, (the Hong merchants.) The following are the different lines of trade:

1. Seawards, in reference to China, hitherto almost exclusively from Canton to Europe, North America, some to India, as well as to the Indian islands. The English are the most important traders; next to them come the Dutch and the North Americans.

2. Overland toward the north, through the Desert Gobi, over Kiachta to Siberia, and from thence partly to Europe. This trade has increased extremely in the last twenty or thirty years. Timkovsky met with many caravans in his journey, each with 100, 200, and 250 camel-loads of tea.

3. Overland toward the west, from the south-west provinces of China toward Mongolia, Bokhara, and Persia.

4. Overland toward the south-west, from the south-west provinces of China, toward Thibet, and the terraces of the Himalayas, Nepal, Butan, &c.

5. Overland southward to Ava and Cochin-China. Much tea is carried to the Burmese from the province of Yunan.

In China and Japan, tea is, in the truest sense of the word, the national beverage, and has been at least for the last thousand years. It is used by all, from the emperor to the common people; it is drunk at all meals, and at all times of the day; it is offered to visitors; it is sold everywhere, in the streets and roads, in public houses, like beer or wine in Europe. It is part of a good education to prepare tea and serve it with grace, this being taught by masters, as fencing and dancing are with us. The true connoisseur in tea can distinguish 700 kinds; nay, it is said, he can even taste what wood was used to boil the water, and in what kind of vessel it was done.

Both the Chinese and the Japanese drink it without milk and sugar; sometimes, however, essences are added to it. It is taken either as an infusion of the leaves (as in Europe) or as a powder, upon which warm water is poured in cups, and stirred up till it froths.

The consumption of tea among the many nomadic races of Northern and Central Asia, is considerable. It renders the bad, saline waters of the steppes drinkable; and tea is a strengthening, invigorating beverage to those who lead a wandering life in a dry, sharp atmosphere.

Similar reasons have given rise to a large consumption in Thibet, where tea is drunk to assist the digestion of the dry barley-meal.

Tea was unknown in Europe before the seventh century. Russia and Holland seem to have been the countries which first became acquainted with it. A Russian embassy to Mongolia received tea in return for its presents, consisting of sable-furs; a protest was made against such useless wares, but they were forced upon the ambassador, and when he brought the tea to Moscow, it met with approval. It is related by the Dutch, that in 1610 they carried to China, sage (a plant in high esteem for its medicinal properties in days of old,) and exchanged this for tea.

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that they may be twisted regularly and in the same direction. They are then spread out in sieves, and placed on stands in a cool room.

For the second roasting, the fire is considerably diminished, and charcoal used instead of wood, and the leaves are constantly fanned by a boy who stands near. When the leaves have lost so much of their aqueous and viscous qualities as to produce no sensible steam, they no longer adhere together, but by the simple action of the fire, separate and curl of themselves. When taken from the *kuo*, they are of a dark olive color, almost black. After being sifted, they are placed on stands as before.

For the third roasting, which is in fact the final drying, the heat is not greater than what the hand can bear for some seconds without inconvenience. The fanning and mode of roasting are the same as in the final part of the second roasting. "It was now curious to observe the change of color which gradually took place in the leaves, for it was in this roasting that they began to assume that bluish tint, resembling the bloom on fruit, which distinguishes this tea, and renders its appearance so agreeable."

The foregoing being the general mode of manufacturing green or hyson tea, it is separated into different varieties, as hyson, hyson-skin, young hyson, and gunpowder, by sifting, winnowing, and fanning, and some varieties by further roasting.

It is stated by Mr. Ball, that the peculiar color of green tea does not arise properly from the admixture of coloring-matter with the leaves, but naturally out of the process of manipulation; and, from some experiments which he made, it appeared that leaves, while undergoing the third roasting in the same vessel, but kept separate by a thin partition of wood, became of a black or a green color, according as they were kept in a quiescent state or in constant motion.

With regard to the coloring and adulteration of teas, much discussion has recently taken place, but the matter may be regarded as tolerably well settled by the investigations of Mr. R. Warrington, who has lately read a paper on the subject before the Chemical Society of London. Various travelers had stated that Prussian blue is used in the *facing* of green teas, while some had imagined the coloring-matter to be indigo. Mr. Warrington has shown that the substances used in *facing* green teas by the Chinese, are Prussian blue, gypsum, and turmeric; and he states, on the authority of Mr. Reeves, that they are used to suit the fancy of European merchants, as the dealers dislike the yellowish appearance of uncolored green tea. "The small quantity employed to give the 'face' precludes the idea of adulteration as a source of profit." Mr. Warrington has also shown that the Chinese prepare what they call *Lie*-teas, to suit the low prices of the English merchants, selling them under this name. One specimen of black Lie-tea was found to be made up of tea-dust, dirt, and sand, agglutinated into a mass with a gummy matter, and rolled into little balls to look like leaves, of which none *whatever* were included. The black Lie-teas are faced with black-lead, the green with Prussian blue, gypsum, and turmeric.—Ed.

The Chinese soon discarded the sage, but the tea found a constantly increasing demand in Holland.

Tea was introduced into England somewhat later. In Pepys' Diary, of 1661, we find: "I sent for a cup of tea, a Chinese beverage, of which I had never drank before." In 1664, the East India Company made the King of England a present of two pounds of tea, and in 1667, a ship received orders to bring home 100 lbs.

Tea appears to have been introduced into Denmark at about the same time. It met with an active opponent in the celebrated Danish botanist, Simon Pauli, who at first asserted that it was nothing else but the bog-myrtle, (*Myrica*,) and afterwards he made such constant representations against its use to Frederic the Third, whose body-physician he was, and who was fond of tea, that the king, one day, tired of his importunities, answered with the well-known equivoque, "*Credo te non esse sanum.*"

A great difference prevails between the different countries of Europe in reference to the consumption of tea. The inhabitants of England use the greatest quantity,* then come Holland and the north. In France and Germany the consumption is but small, but has begun to increase in quite recent times; in the south of Europe very little is consumed.

While, in 1711, only 142,000 lbs. were consumed in Great Britain, the consumption in 1781 amounted to 3,500,000 lbs.; in 1785, (after the duty was reduced from 119 to 12 1-2 per cent.,) to 13,000,000 lbs.; in 1801, to 20,000,000 lbs., and 3,500,000 lbs. for Ireland. The consumption has increased since then, for example, in 1828 it was 27,000,000 lbs. for Great Britain and Ireland, but not in the same proportion as the population has. The cause of this lies especially in the monopoly of the East India Company in China, on account of which the English had, up to a few years ago, to pay twice as high a price for tea as it fetched in Hamburg or Amsterdam, and since the duty (100 per cent.,) was determined in proportion to the price, the tea had really to pay a quadruple price, without great advantage to the Company's interests. Since the monopoly was abolished in England, and the duty reduced, the consumption has increased, so that it may be estimated now at 36,000,000 lbs. for the British Empire, which makes about an average consumption of 1 1-2 lb. for each person, (2 lbs. for Great Britain, 1 1-2 lb. for Ireland.) In Holland, the consumption amounts to 3,000,000 lbs.; in the north of Germany, to 1,500,000 lbs.; in France, only to 230,000 lbs.; in Russia, on the contrary, 5,500,000 lbs. The consumption of the whole of Europe may be put at about 60,000,000 lbs. North America consumes 10,000,000 lbs. The value of the tea which China exports by sea has been estimated at 11,000,000 piastres, (about 2,000,000*l.*)

Opinions are, it is well known, divided with regard to the beneficial or injurious effects in a dietic point of view. But it may surely be assumed that tea is, on the whole, a wholesome beverage, when not used in excess. Its reviving and refreshing power is especially experienced after a hard pedestrian journey, or any other effort; it opposes corpulence and sleepiness; it does not intoxicate, but acts against the intoxication produced by strong drinks.

Tea was celebrated in verse by the Chinese emperor, Kien-Long. His poem was written on a hunting-excursion; it was greatly admired, published in a splendid edition, and introduced upon porcelain cups, which were used for imperial gifts. Among other things we find in it:

"Set over a moderate fire a three-footed vessel, whose form and color indicate that it has been long in use; fill it with clear water of melted snow; let this be warmed to the degree at which fish grows white and the crab red; pour this water into a cup upon delicate leaves of a choice kind of tea; let it stand awhile, till the first vapors, which form a dense cloud, have diminished, and only a slight cloud hovers over the surface. Drink then slowly this delicious beverage, and thou wilt become strong against the five cares, which commonly disturb our spirits. The sweet *calm* which is obtained from a drink thus prepared, may be tasted, felt, but not described."

The Europeans seem to have been agreed that wine is the only beverage that deserves to be celebrated in song. That the Chinese consider their national drink worthy of it, is not wonderful. Is there not some one-sidedness in the fact that we only sing of the beverage which awakens passion, and not that which calms it? But truly war is more frequently celebrated than peace.

THE WATER LILY.—It is a marvel whence this perfect flower derives its loveliness and perfume, springing, as it does, from the black mud over which the river sleeps, and where lurk the slimy eel and speckled frog, and the mud turtle, whom continual washing can not cleanse. It is the very same black mud out of which the yellow lily sucks its obscene life and noisome odor. Thus we see, too, in the world, that some persons assimilate only what is ugly and evil from the same moral circumstances which supply good and beautiful results—the fragrance of celestial flowers—to the daily life of others.
—*Margaret Fuller.*

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* 12,000,000*l.* is annually paid for tea in Great Britain—four times the amount paid for coffee. (Crawfurd, 1852.)

The Strawberry Question.

It will be well, perhaps, to pause a few moments in the midst of the contest excited by this subject, to inquire what the discussion is all about. The cultivators on one side, and some Botanists on the other, are engaged in a conflict as formidable and threatening as the fabled battle of the frogs and the mice. It is time to recur to the original source of the unhappy disagreement, that we may understand its basis, and solve, if possible, its difficulties. I apprehend that there is no real ground of difference; that the existing contest is solely referable to a misuse of terms, or to a too strict interpretation of terms used in a qualified sense; and that a reconciliation will be promoted by a few accurate definitions, mutually illustrative of each other's meaning. Let us see if this suggestion has not some promise. In attempting the definitions alluded to, I must necessarily present some elementary details, which may be regarded as trite, but these are demanded by a comprehensive analysis of the question, and will be excused by the interest the discussion has generally elicited.

The strawberry is the genus Fragaria of Tournefort, and belongs to the great natural Family Rosaceæ, or the family of which the common wild rose, Rosa canina, is the type. The recent sub-divisions of the order are not necessary to our present purpose. The family is distinguished by its regular and perfect flowers, with occasional variations by imperfect developments or abortions; its calyx is four to five-lobed; petals five, perigynous; stamens numerous, indefinite, attached to the calyx; pistils numerous, forming seed-like achenia, attached to the surface of a conical, enlarged, fleshy receptacle, that becomes the fruit, maturing in early summer. In one of our American species, *F. Virginiana*, the achenia are buried in the substance of the receptacle, just below the surface; in the other, *F. vesca*, they are prominently externally attached to the surface.

These achenia, or carpels, are quite numerous, and each one, in a perfect state of development, has its own separate and perfect pistil. Each berry, therefore, should have a great many, say 20 to 40, pistils, distributed over its surface. These pistils are not to be found at the terminal point of these minute achenia, or seed-vessels, but they are lateral, or rather, and more properly, basilar: that is, they are attached at the bases of the achenia, and are to be found nearly or quite in contact with the surface of the receptacle; sometimes, as stated, being actually enclosed in it. Consequently, the pistils, or their undeveloped rudiments, may be difficult of observation. It should be particularly noted, also, that the stamens, also numerous, in a perfect flower, are placed upon the divisions of the calyx, outside of the white petals, and must be searched for accordingly, by pulling down the sepals so as to expose their internal surface.

Now these characters of Fragaria are normal and positive, though not constant; they are essential to the genus, not permanent in the individual. It is important to distinguish what is peculiar to an individual, and what is essential to a genus, or species. Various causes unknown to science are constantly occurring to produce imperfections and modifications in the several parts of plants; striking variations from normal conditions are frequently, indeed, so often repeated, as to assume the appearance of permanent characters. The irregularity in such cases, is discovered by a reference to the generic type; to some perfect specimen of the natural plant. Instances of these alterations in the completeness of the several parts of a flower, are numerous. They depend upon imperfect growth, degeneration, or the casual suppression of one or more parts, and frequently, as I have intimated, result in permanent deviations from unquestionable normal forms. The branch of the science of Botany that embraces the morphological laws of these changes is called Teratology, and entire treatises are devoted to the subject. We have to do now, however, with a question of less magnitude: that is, the casual suppression of certain normal parts of flowers. All the parts of a flower are subject to these abnormal imperfections. Sometimes the division of a calyx is wanting; sometimes one or more petals of a corolla fail to perfect their growth, or disappear altogether. The normal condition of the campanula is to have a bell-shaped, five-lobed corolla; yet in the C. perfoliata it is sometimes entirely wanting, all other parts of the flower being in their natural

state of development. The same accident occurs in a species of Ruellia, in one or two species of Viola, in Teucrium Botrys, Lamium amplexicaule, Melilotus officinalis, etc. The ordinary campanulate form of the flower of the Cobea scandens is well known, and very constant; yet it is sometimes seen divided into five separate petals. The purple Snapdragon, though entitled to four and sometimes five stamens, is occasionally entirely destitute of them. The transformation of stamens to petals, in double flowers, as in the Nymphea and Rose families, is a familiar instance of abnormal metamorphosis. Transformations, as well as the entire suppression of pistils, are also of frequent occurrenee. Complete occasional abortion of the carpels are met with in several families of plants. In Nigella, Delphinium, Aconite, and others, the number of pistils vary from two to six, in flowers of the same individual. The pistil of the Almond, Cherry, Plum, and Peach, is said by Botanists, to consist primarily of two carpels, only one of which comes to maturity. Pistils, says Balfour, are sometimes changed to stamens, and bear pollen. These instances, to which many more might be added, will illustrate the abnormalities of the Strawberry plant, to which I now return.

The Fragaria vesca, from which come many cultivated red and white varieties, pretty constantly conforms to the natural conditions of the genus: that is, its flowers are hermaphrodite, or perfect. But it has been observed that the flowers of the American species *F. Virginiana*, or the common scarlet, and also those of the English Hautboy, in its numerous varieties, together with the pines, and some South American varieties, both wild and hybrid, present discrepancies, or departures from the normal conditions of the plant; these have arrested the attention of cultivators, who have turned the discovery to good practical account. They have observed that in some plants the stamens are nearly, and even quite suppressed; while in others, the stamens are perfected in great numbers, coincident with the entire or partial abortion of the pistils. The testimony to the existence of these abnormal peculiarities, is too abundant and consistent to leave any reasonable excuse for doubt as to the reality of the fact. The evidence is competent and conclusive: as, the special analysis of thousands of individual flowers; the total and repeated failure of certain groups and beds of plants to produce any fruit; and the improvement in the bearing qualities of such groups, consequent upon the introduction amongst them of plants equally infertile by themselves, but capable of fertilizing or being fertilized by their degenerated and imperfect associates.

Now, if this fact may be thus positively stated, if it be affirmed by such competent and reliable authority, and if, further, it be, as I have shown, consistent with other acknowledged morphologies and irregularities in the vegetable kingdom—if the imperfection has so many familiar analogies, why all this controversy about it? Whence the hesitation to concede it? The opposition to the theory has had, I apprehend, a two-fold origin: in the first place, it has been announced and defended without a due regard to the value of the terms used to explain it; and, in the second place, its advocates have claimed for it too much—more than they can yet prove. First, for the terms. These, in Botanical science, are fixed and uncompromising. They are exposed to frequent popular misuse, but with all conversant with their proper technical use, have a determinate and uniform sense. The instance afforded by the present discussion is, perhaps, a good illustration of this point. In Botanical science, there are four classes or descriptions of floral organic development: first, the perfect or hermaphrodite, with the reproductive organs in the same flower; second, the imperfect or diclinous, the reproductive organs occupying different flowers, which are monoicous, (or monœcious,) when the staminate and pistillate are upon the same root, and dioicous when they are upon different roots; third, the mixed or polygamous, the flowers presenting variously both these peculiarities, some being perfect and others diclinous, upon the same root; and fourth, the concealed or cryptogamous, in which the reproductive process is not apparent. The forms and characters included in these several classifications—which, by the way, are quite natural—are constant and well known, and the terms used to express them are intelligible and significant. The words perfect or hermaphrodite, pistillate, staminate, etc., have a fixed and definite signification, and their inappropriate use will lead only to

confusion and misunderstanding. I have thought that here is one source of the difficulty in the discussion of the strawberry question. Cultivators, and other observers of the variations from normal conditions in the strawberry blossom, have used the strict terms, pistillate for flowers in which they found the stamens suppressed, and staminate for those in which the pistils were wanting; describing, as an easy consequence, the strawberry plant itself as, therefore, discecious, or dioicous, the better term. Now, to those whose botanical reading had accustomed them to a strict definition of the terms of the science, these descriptions conveyed a notion of the Fragaria entirely at variance with all former descriptions, with the diagnosis of the natural order to which it belongs, and, indeed, opposed to all previous knowledge of the characters of the genus; and not only so, but really contrary to their own observations of the plant in its natural state. For generic descriptions are expected to be founded on normal characters, not upon casual exceptions, referable to degeneracy or abortion. It is certain, beyond controversy, that the natural character of the perfect strawberry blossom is hermaphrodite; that it has a central conical receptacle or torus, supporting numerous pistillary carpels, each enclosing a seed, and surrounded by numerous fertilizing stamens, seated upon the enclosing calyx. There can be no doubt of these being the essential normal characters of the plant. A single plant, presenting these perfect parts, would prove it against twenty thousand other plants, bearing flowers presenting abnormal discrepancies and suppressions. The fully developed typical flower establishes a law for its kind, that no individual deviations, however often repeated, can annul or weaken. It being the law of the Fragaria, then, to reproduce its kind by means of flowers perfect in all their organs, any departures from this original typical form must be regarded as casual degeneracies, and by no means as constant or essentially characteristic. To the objection that may here be made, that a diclinous habit may be a specific character, I would reply, that the species is governed by the same laws as the genus. The highest typical forms must have precedence and control—the exceptions must yield. Even varieties must stand on very constant deviations. A dioical species of the Fragaria is possible, of course, and may have escaped the notice of the elder Botanists; but it must be established on constant and uniform characters, not upon such as are merely exceptional or occasional. The Fragaria Virginiana frequently presents the abnormalities of non-pistillate and non-staminate flowers. But the same plant is found bearing flowers perfect in all parts; and, as these indicate the capabilities of the plant when perfectly developed, they must be regarded as typical, and the species maintains its integrity intact. The same must be said of the Hautbois, and other varieties in which the peculiarity alluded to has been observed.

Second, the more recent advocates of the theory have claimed for it too much. That is, they have asserted that these abnormalities are fixed and permanent, natural and transmissible. I need only say to this, that if they are so, the plants in which they are discovered are really dioicous; and as they are, therefore, inconsistent with the characters of any described species, must be considered as a new one, and the terms dioicous or diœcious, pistillate and staminate, may be used with relation to them, positively and without qualification. It is better, however, to regard the question, in this view, as undetermined, and to let it abide the result of future and more extended observation; for the point is, simply, what is the natural fact.

To what complexion, then, must this question come at last? I think it a mere controversy of words. Two points are presented for solution. It may be said, generally: First, that the strawberry is not correctly a dioicous plant: that is, it is not permanently so, by original constitution, in any recognized species; and that, therefore, the instances in which it is so by suppression of some organs are casual and exceptional. Or, second, that the dioical character of some varieties known to cultivators, *is* permanent and constitutional, and that, therefore, a new normal species has been discovered, which may take an independent position at once, as the *Fragaria dioica*, or rather, perhaps, *Fragaria abortiva*. There can be no objection to the new species, if well established on uniform and constant characters, though it may be premature to assert its existence at this time. But until

it is done, the suppressions discovered in the blossoms of certain species and varieties must not be too confidently claimed as permanent and unvariable. That they do seem to be so, in some varieties, and in extended series and innumerable repetitions, is a fact well confirmed by long observation; so long, indeed, as I shall show, that perhaps the species is already consistently made out, on characters really normal and unchangeable. But this is not now claimed.

To return to another point: the practical importance of the discovery is not impaired by a correction or qualification of the terms used in making it known. A strawberry blossom that has no visible stamens, is not, strictly and botanically, the pistillate flower of a dioicous plant, because the blossom is normally entitled to stamens, may some time produce them again, and has the rudiments of them upon its calyx. But, on the other hand, it is virtually so to the cultivator, for he finds the suppression so enduring and protracted, that his non-staminate flowers will produce no fruit without the association of others, in which staminate organs are present. But the imperfect condition of his blossoms is the result of non-development and abortion, and in no wise affects the correctness of the recorded descriptions of the genus in all its varieties. I am inclined to think that if the terms pistillate, staminate, and diæcious, had not been so positively and broadly used in the statement of these facts, the existing discussion would never have arisen; unless there may be those so far in the rear of a true knowledge of the facts, as to contend that these suppressions and imperfections do not occur to the extent they are alleged to.

There is a distinction to be observed in the use of the term fruit. I have said the non-staminate flowers will produce no fruit without due association with perfect or stamen bearing flowers. In botanical language, the seed is the fruit; and this is what I mean in the above statement. What connection may exist between the production of fertilized seed, and the proper maturation of what, in domestic language, is called the fruit, as the fleshy calyx of the pear, the succulent receptacle of the strawberry, the feculant pulp of the banana, etc., is still a matter of inquiry. Mutual dependence in these parts would seem to be the natural law, but there are decided and numerous instances to the contrary. The finest and most luscious bananas mature no seed; indeed, the ripening of the seed in this plant exhausts the juices of the berry, producing a dry, comparatively worthless pericarp. The fig is a diclinous plant, the male flowers of which are frequently, if not generally, abortive, but the comestible receptacle ripens nevertheless. Says Tournefort, speaking on this subject, "the fruit or fig grows and matures, and becomes excellent to eat, though the seeds be not fecundated." The same is true, as is well known, with some varieties of apples. But I do not intend to discuss this point here. I allude to it only to say, that it is not yet demonstrated, in the case of the strawberry, that the fecundation of the seed is essential to the maturation of the receptacle or fruit, which has no functional relation to the pistils or carpels and their fertilization.

A few words upon the history of this interesting question, and I will relieve your attention. Why, whether in commendation or blame, the discovery is referred to Cincinnati cultivators, or takes with some the name of the Cincinnati theory, I am quite at a loss to determine. Strawberries were not grown, and scarcely were eaten, in Cincinnati, when the abnormal character of some varieties of the plant was made known by respectable authorities. Keen, a well known English cultivator, whose name is borne by some favorite varieties, writing, I think, in 1815, uses the following emphatic language: "There are many different sorts of Hautbois; one has the male and female organs in the same blossoms, and bears freely; but that of which I most approve, is the one which contains the male organs in one blossom, and the female in another. In selecting the plants, care must be taken that there are not too many of the male plants among them, for as these bear no fruit, they are apt to make more runners than the females. I consider one male to ten females the proper proportion for an abundant crop. I learned the necessity of mixing the male plants with the others, by experience, in 1809. I had, before that period, selected only female plants for my beds, and was entirely disappointed in my hopes of a crop. Suspecting my error, I that year obtained some male blossoms, which I placed in a

bottle on the bed of female Hautbois. In a few days, I perceived the fruit near the bottle begin to swell; on this observation, I procured more male blossoms, and in like manner placed them in bottles in different parts of the bed; and, by this means, obtained a moderate crop where I had gathered no fruit the preceding year."

Smith, the author of English Botany, published in 1820, I think, describes the Fragaria Elatior, (from which comes the Hautbois,) and says of the flowers, that they "are usually diœcious from abortion." Don, in his Gardeners' Dictionary, says of the same species, that "fertile plantations of it will produce runners that may, perhaps, be sterile, and seedlings, many of which will prove so. In all the sorts," he adds, "of Hautbois there exist prolific and sterile plants, which last have long stamens, and are commonly *called* males." The careful language of this competent investigator is to be admired: if the terms he uses, (this was in 1830,) had been adhered to, the necessity of recent discussions and explanations would have been obviated. Duchesne, Lambert, Tournefort, and other of the earlier Botanists, describe the Fragaria Virginiana and F. elatior, as "diœcious from abortion."

In the New Monthly Magazine, published in June, 1821, is the following paragraph, in an article on apple and pear culture: "On the Gansell and Bergamot pear, though the blossoms at first seemed to set, yet not a single pear arrived at maturity. Dissection of some that fell, indicated some imperfections in the essential parts of the blossom. In the following spring, I impregnated the stigmas of many of the flowers with the pollen of the Beurré, and most of them came to perfection and produced large, well-formed fruit. * * * Whether the result of the above experiments be such as to authorize an expectation that artificial assistance in vegetable fecundation will hereafter become of as much importance to gardeners in the instances alluded to, as in those at *present recognized* of the cucumber, the melon, the Hautbois strawberry, etc., must be left to others to ascertain." I think some of our eastern friends who are making Cincinnati the aim of their gibes and censures, and pouring their shot into western cultivators, may with propriety turn their guns in another direction, if they can not, rather, amend their manners altogether, and repent of their long unbelief. J. W. W.

[This paper was read, by request, at a recent meeting of the Cincinnati Horticultural Society, and is properly a part of their transactions. Some further notes upon the plant in bloom will be given in due season.]

Correspondence.

JAMES W. WARD, ESQ.,

EDITOR OF BOT. MAGAZINE:

You are rather severe on your worthy brother of the Florist, in your last number. He has troubles enough at this time, without your article. I fear that he will not hereafter adhere to his doctrine, that "a pure pistillate plant is a monstrosity; a female, who will labor day and night, till she gets a husband at her elbow," as Mr. Meehan's female Hovey did, in a short space of time, with the aid he gave her. The subject has been before a committee of the Philadelphia Horticultural Society, and they have examined the Hovey of Mr. Meehan, and positively declare it is not the true Hovey. This was no difficult task to the intelligent men who composed that committee, as the small children of our strawberry growers can, from the stem and leaf, point out the true Hovey.

He wishes me to purchase Gray's Elements of Botany. When I wish to settle this question from the opinion of a Botanist, I shall go back to the father of them all, the great Linnæus, who held the same views; and when one of his disciples wrote him that he had discovered plants that were pure pistillates, and would not, without impregnation from an hermaphrodite or staminate, bear a single fruit, he was told to advance no such doctrine, as the plants he saw must have had the blossoms killed by frost. I do not censure these learned Botanists, who depend on books, and never noticed the difference between a male and female blossom, though the difference can be seen at the distance of twenty feet. It is most unreasonable to ask them to set aside the doctrine of all learned Botanists, and pin their faith on the opinion of an illiterate market-woman, (Mrs. Arbigurst,) to a chance observation of whose son we are indebted for the information.

Your brother refers me to Mr. Lindley. Mr. Lindley, in having an answer sent to a

letter of mine, on this question, says the subject is new to him; that he had received the plants of the pure pistillate that I had sent him, (McAvoy's Superior,) and would test the question; that he had supposed that the failure in some plants to bear fruit, was not from a defect in one of the organs, but from frost.

Your brother, in his last number, says: "We really flattered ourselves the strawberry question was settled." I fear the way their committee have settled it, will not be flattering to his feelings. Can you not relieve his mind?

Yours, respectfully,
N. LONGWORTH.

[We publish this note of Mr. L. with pleasure, because, having done more than any other man to promote the correct culture of the strawberry, his thoughts are entitled to attention. I have but two remarks to add: First, the son of the market-woman alluded to was not the first who made the "chance observation," or published it to the world; as will be seen in the essay on this subject in the present number. Second, reference being made to Mr. Lindley, it should be noted that, speaking of the genera that compose the family to which the strawberry belongs, (the Rose family,) he says, their flowers are perfect, naturally, though sometimes, diœcious from abortion, whether naturally and specifically, or abortively so, is immaterial to the cultivator.—J. W. W.]

Flowers in Palestine.

Lord Nugent, in a recent work of travel, thus speaks of the flowers of Palestine:

"Our way lay over a high bank to the northwestward, shaded by a grove of ancient olive and oak trees, and commanding a splendid view of Nablous and the country beyond. Thence we descended rapidly into a white valley, proceeding for an hour along lanes flanked on each side with gardens of mulberry and fig.

"The richness of the whole valley is hardly to be described. Between the gardens and the road, the margin is lined with a natural and abundant growth of aromatic bay trees of great size, and pomegranates and medlars in full bloom thus early in the year. In many places they overarch the road for some distance. Bright streams and fountains gush forth on all sides to join in a wide and rapid stream that flows westward, in the opposite direction from those on the other side of the hights we had just left. This is the 'Vale of Many Waters,' and we had passed the boundary which divides their course.

"In a quarter of an hour further, the village of Beitwaden was on our left; and now, turning more to the north, we mounted a ridge of low hills, where tillage and garden culture ceases, and the soil is no longer deep enough for the growth of trees; but the stony ground is covered with ranunculus, anemone, and lupine of a great size and dazzling brightness of blue and white.

"Three hours and a half took us to the foot of the mountain range which parts this vale from that of the Kishon. On both sides of the track along which they gained the top, towered the gray stems of lofty trees, whose foliage quivered against the clear blue heaven, in many places almost closed over our heads. It was much the same sort of scenery as that through which we had passed on our ride to Tabor. But the ash mingling with the oak here, gave it more the character of the finest English greenwood, than of part of Whittlebury or the New Forest.

"Alas, for the little wild flowers of England that here and there peep forth and sparkle among the brambles of the thicket, or cluster in bunches far apart from the short turf of the open grove, when compared with the blaze of the rich ranunculus, anemone, and gaudy iris, carpeting the green sward of Palestine, and the cyclamon that absolutely perfumes the air far around! Yet one principle of gladness is wanting in these lands, to which the classical and sacred writers were not insensible in their descriptions of the charm of woodland scenery, but which is never enjoyed here in the measure in which it abounds in our northern countries—the song of birds. Nothing is to be seen moving in these shades but here and there the majestic crane stalking between the boles of the trees; nothing heard but the rustle of the kite or vulture, when he bursts from among the boughs and flies screaming to the skies. And these but bespeak the deep loneliness which for a moment they disturb, to leave it without a living thing to be seen, or a living sound to break the silence of your solitary path."

KEEPING THE MEMORY GREEN.—The late Elliott Cresson, of Philadelphia, distributed by his will $127,000 for philanthropic objects. Among his donations was one of $5,000 to Philadelphia City, to be expended in planting trees. After all his other munificent gifts are forgotten, this one will be remembered more gratefully than ever before, and as long as the trees live to throw their charming shade on the dwellers in that pleasant city, will the memory of CRESSON be kept in living green.

Editor's Bureau.

Summer Climate.

THE article on this subject found on another page of this number, will be read with interest. It is taken from a pamphlet, published by the author, in which are embodied the general tables and figures upon which his statements are based. This is turning the records of meteorological observers to good account. Indeed, but for these general results, drawn from a mass of compared and contemporaneous observations, the local tables of hights and variations of the thermometer and barometer, would be of little use. It will have been noticed, that we have omitted the meteorological table heretofore published in the Review. We have done so because its preparation was expensive—because it was only repeating, six weeks after date, what had already appeared in two of our city papers, and because it was barren of interest to the generality of readers. It can be no possible entertainment to read over a page of figures, forgotten as soon as read; and it as certainly can be of no possible advantage to one not engaged in extensive observations and comparisons, to know the daily hight of the thermometer at Cincinnati, or any other place; or to know which way the wind blew daily, through the month. To the professed meteorologist, gathering similar records from hundreds of different points, whose business it is to compare and reduce the local tables furnished him, and to draw from them condensed statements and analyzed results—to him these various tables are not only interesting, but useful and necessary; and his deductions and generalizations will be popularly instructive, as in the abridgment we have published. There can be no interest to the general reader, in perusing these tabular minutiæ, especially when limited to one locality. These are only useful for extended comparisons and analysis, embracing data from a large number of separated localities. And this is a business of time and patient labor, to be accomplished only by some person competent to the task, especially devoted to the subject, and occupying some central position of observation and address.

This service is now in charge of Mr. Lorin Blodget, at the Smithsonian Institute, Washington, and there can be no doubt of his ability to condense from the mass of details communicated to him monthly, by over five hundred careful observers, general statements, —if not, by and by, positive laws—of practical interest and utility to the cultivators and crop-growers of this country. These deductions and summings-up we shall publish as often as we have opportunity; and, meanwhile, shall give, for the growing months, such special statements of the weather and its most marked changes in this locality, as will be likely to interest the general reader, leaving the daily detail of figures and means, which often mean nothing, to those better prepared to make something out of them.

We have received from Muscatine, Iowa, the Meteorological Record for 1853, kept at that place by Mr. T. S. Parvin, which we shall preserve for purposes of reference hereafter, as occasion may require. We are obliged to the author for the copy.

Spring of 1854.

The Spring opens with a genial mildness that gives much promise for the budding vegetation of the season. Flowers and fruits are now, the 20th of March, in fine health and vigor, and, but for the apprehension of possible frosts yet to come, give cheering encouragement of a fruitful and prosperous year. The temperature of February was pleasant, the lowest temperature occurring on the 3d, when the mercury fell to 18°. The month was marked by frequent high winds, which, in some localities in the Ohio valley, raged in several instances with destructive violence. March came in with winning gentleness, and maintained a mild, summery temperature, with occasional night frosts, till the 17th, when a freezing temperature was attained. Fresh winds have prevailed, with now and then a brisk,

clarifying gale, in agreeable and exciting contrast to the stagnating calms so frequent in our sheltered valley. Several heavy falls of rain have occurred, producing considerable freshets in the Ohio and some of its tributaries. Eriginia bulbosa was open on the 6th of the month; Cardamine and Ulmus Americana on the same day; Dicentra on the 15th; Claytonia, Acer rubrum, Thalictrum, Viola, Sanguinaria, etc., before the 20th. The Apricot and Plum were also seen in blossom on the 19th. Peaches will probably bloom by the 25th; indeed, their buds are now swelling.

Fruit Prospects.—Varying accounts appear in correspondence and in the papers, from which, however, in connection with the warm weather of March, great apprehensions are entertained for the result, if late frosts should follow the warm spell. Friend Tallant, of the Iowa Farmer, speaks quite encouragingly for all varieties of fruits—on a rigid examination, he failed to find a single blighted peach-bud. Private letters from different parts of the West, indicate a considerable apprehension as to the condition of the peach buds. Our own observations have shown a sufficient portion of those that were alive, and even since the frosts that have occurred since the middle of the month, while they were expanding.

The Flower Markets have again been opened with the return of mild spring weather. The displays are creditable alike to the enterprise of cultivators, and to the taste of the purchasers. Of both classes we can boast of numbers in this city, and there is no point to which we direct strangers, with more pride and pleasure, among the *institutions* of the place at this season, than the flower stands, where every taste may be gratified at a trifling expenditure.

To Correspondents.—The request of N. A. shall be attended to. We are sorry to have to say to J. R. S. that there is no one in this vicinity paying particular attention to the cultivation of Orchids; it may be said, indeed, that they are entirely neglected, and nearly unknown here. This is a great pity; for of all the families of flowering plants, none present so many attractions; by their varied beauty and splendor, they well reward the cultivator for the little care they require.

New Books, etc.

Heroic Women of the West. Comprising examples of courage and devotedness, etc., among the Pioneer Mothers of the Western Country. By John Frost, L. L. D. Phila.: A. Hart. Cincin.: H. W. Derby.

The courage, the constancy, and fortitude of the true heart of woman, have been sung by poets, and recorded by historians, from the earliest days of human history. Her heroism, indeed, in occasions of trial and peril, has been the admiration of the world. The popular author of the work before us has seen so much of it, in the early pioneer women of the Great West, has had his enthusiasm so kindled by his frequent contemplation of it, that he has been led, and wisely, we think, to print a book about it. He has ransacked the chronicles of our early history, and whatsoever has related to woman, and her strong and hopeful heart, he has set down in an attractive and interesting manner.

The Working Man's Way in the World; being the Autobiography of a Journeyman Printer. N. Y.: Redfield. Cincin.: H. W. Derby.

Eventful, changeful, marvelous, is the life of many a journeyman printer. The one who has here sketched to us his chequered career, seems to have been an unusual specimen of the class—by no means to be regarded as a type of the genus. The book is written in a sprightly, earnest style, somewhat too prolix and minute, but interesting as the unfolding of the life-history of one whose experience may be useful and suggestive to his fellows.

Iowa Farmer and Horticulturist.

This spirited monthly makes its appearance in good season, and with its leaves full of valuable matter, well worth the dollar required of subscribers. The March number, just received, contains, among other standard articles, the commencement of a series upon the culture of Flax, which is a staple crop in the Northern States, and one likely to become of immense value, now that ingenuity, directed by science, has been brought to bear upon its preparation. A correspondent warmly advocates our favorite hedge plant, the Maclura. The *Farmer* has also given us a very flattering reception, for which our thanks are returned.

ANNUAL REPORT of the Secretary of the Massachusetts Board of Agriculture.

This is a very valuable document, and highly creditable as a public document, not only for its matter, which is excellent, but for its style and appearance also. Would that all works emanating from governments were equally well prepared.

Mr. Chas. L. Hunt is the indefatigable Secretary of the Board, and he has expended much labor in collecting, collating, and more than all, in condensing and arranging information of a reliable character. In this he sets a commendable example to some other officers occupying parallel situations, which may be followed with advantage to all. One article, on the Cranberry, is sufficient to give value to the Report; another, on the Climate of New England, is also full of interest, for all now recognize the value of meteorology to the agriculturist.

SOUTHERN PLANTER.

The early numbers of the fourteenth volume of this valuable, and now venerable, Agricultural periodical, have been received, and are welcomed. It is a monthly of thirty-two pages, published at Richmond, Va., at one dollar a year in advance. The name of RUFFIN, the indefatigable pioneer of "*restoration*," is a guaranty of the useful character of the work. The calcareous essays of Mr. Ruffin have immortalized, but not fossilized him. Long may he live rather, to benefit his fellow man by his instructions, although he has already made his limy trace upon many a worn-out tract of land, in fossil characters that may be read by every observer of the restored luxuriance of Virginia soils.

These numbers of the Planter are chiefly occupied with the reports of the great State Fair of last Autumn, and with details of experiments that have been in progress for the improvement of the soil.

THE MAGAZINE OF HORTICULTURE, BOTANY, AND RURAL AFFAIRS. By C. M. HOVEY, Boston.

The March number of this favorite monthly was duly received. It contains a carefully prepared and interesting article on certain varieties of fruits, and their culture, with special reference to the American climate.

We have also received the FLORIST, by H. C. Hanson, Philadelphia, a journal worthy to be known of all our readers. It has taken a prominent part in the strawberry discussion, concerning which the editor has certainly very *decided* views. The number contains a colored figure of the Begonia Prestonensis, the first successful hybrid, it is said, of this favorite genus. It is certainly a beautiful one.

Our thanks are due, for kind notices and exchange copies, to the Prairie Farmer of Chicago, The Farmers' Companion, and the Ohio Farmer; excellent papers, worthy of all acceptation.

TRANSACTIONS.

The Cincinnati Horticultural Society

Has continued its meetings during the month with usual spirit and satisfaction.

The strawberry discussions have been renewed by some who were unwilling to believe that Nature ever departed from her accustomed path, or rather, from those "laws" which man, in his limited observations, had chalked out for her. Extended and unprejudiced observations alone are needed to convince all that the strawberry, whether wild or cultivated, presents, in its varieties, four distinct forms, or characters, of inflorescence. *First*, those called *Pistillate*, from the fact that the stamens are abortive, and not to be found without a dissection of the flower; these are the sorts that are to be relied upon for a crop of fruit, but they must have others with stamens planted near them, or they will be unproductive. *Second*, those called *Staminate*, which are perfectly destitute of even the rudiments of pistils. These are not often found planted in cultivated beds, as they are necessarily fruitless. *Third*, those called *Hermaphrodite*, or perfect, having both sets of organs, stamens and pistils, *apparently* well developed. These are not generally good and certain bearers, as we should expect them to be; the same plant will produce well one year, and indifferently the next. With few exceptions, they bear poorly, owing to some inappreciable defect in the pistils. The fruit is often very large and fine, though in limited quantities, in proportion to the number of flowers produced, say one tenth. This class embraces many of the most renowned European varieties; but for field culture, few of them can be depended upon for a certain crop. The *Fourth*, a rare class, is a sort of subdivision of the preceding, and has not only hermaphrodite flowers, but also some on the same truss that are of the pistillate character, and sometimes, in a single plant, presenting also a truss on which all the flowers are pistillate.

Now, these four divisions are natural and real; they are also founded upon permanent characters, so far as we have been able to discover, after a most thorough investigation,

extending through a long series of years, during which millions of strawberry flowers have been examined with the severest scrutiny.

All that is asked of those who question the teachings of this Society, is, that they would prefer the book of Nature itself, as a source of information upon a mooted point, before the readings of that book transcribed to printed pages, by men, like ourselves, liable to err, and who, how wise soever, have happened to overlook some minute details in natural history—mere matters of observation, where one set of eyes is as good as another. This has been decried as a small and unimportant question—so it may appear to some. To the sellers and buyers of abundant crops in our markets it is not so; nor, to some of us, is it a small matter that truth should triumph.

Mr. A. H. Ernst read a paper upon the pear-tree, its origin, the various diseases to which it is liable, their causes, and the proper remedies, and mode of cultivation to restore the tree to health.

On motion, it was ordered to be placed among the transactions of the Society, and that a copy be presented to the Editors of the "*Horticultural Review and Botanical Magazine*," with a request from this Society that the same be published in the next number of that magazine.

The reader can also compare the views of a great pomologist in the north part of our State, Dr. Kirtland, which are also reprinted on page 160. Both writers are earnest seekers after truth, and equally desirous to benefit their brother pomologists, by imparting the valuable results of their observations.

Fruits have continued to grace the tables—apples, pears, and even grapes in a good state of preservation. Pecan nuts were shown by Peter Zinn. These trees have been cultivated by several persons, but while young they do not bear well; perhaps they may behave better when they arrive at years of discretion. Bartram once advised grafting with scions from an old bearing tree. It is said that the pecan will thrive if set upon the hickory stock.

J. A. W.

United States Agricultural Society.

The Second Annual meeting of this central organization convened at Washington, on the third Wednesday of February, which being the anniversary of the birth of the great agricultural President, the meeting was adjourned till the next morning; when the President, M. P. Wilder, made his annual address, in which he set forth the objects of the Society, and indicated several subjects, to which he directed the attention of the members, in hopes of advancing the cause of Agriculture, and rendering the action of the Society more efficient. The address was referred to committees to report suitable action upon the recommendations.

Communications were read, requesting an investigation of certain plans of preventing the ravages of the potato rot, and of the curculio, the former of which was referred to the Executive committee, to examine and report to next meeting, and the latter topic was referred to a select committee, consisting of Messrs. Wilder, Brinckle, and Berkmans.

The Guano question was urgently reported on by Mr. Bradford, of Delaware, who asked a memorial to Congress in favor of annexing the Chincha Islands by purchase, or that negotiations be entertained with the Peruvian government, to secure a full supply of this valuable manure.

Professor Fox, of Michigan, delivered an address on the best means of extending Agricultural Education in the United States, which was listened to with profound attention.

A communication from Mr. James Pederson, on the subject of introducing the Alpacca or Peruvian sheep into the United States, was then read by Mr. Munn, of New York.

Papers collected by the Lighthouse Board were presented by Prof. Henry, who made some interesting remarks on one of them, being a paper on the use and importance of Colza oil for burning. He also proposed to distribute seed.

An ear of yellow sugar corn was exhibited from Mr. Henry Ives, of Ohio, and a distribution was made by a member.

Professor Mapes, of New Jersey, exhibited and explained an improved sub-soil plow of his invention, manufactured by Ruggles, of Boston. The remarks of the Professor were listened to with great attention. The peculiar excellence of this lifting sub-soil plow is, that, from its construction, the friction is much reduced, and yet the deeper soil is loosened. It may also be used as a deep tiller of drilled crops; and, besides this, to loosen old meadows and pastures, without turning the surface. To gardeners and nurserymen, it is specially recommended for stirring the ground deeply where rows of plants are to be set; it will thus also give a deep tilth under the rows of corn in the field, if used for marking out, but thorough deep culture should be preferred.

Dr. J. A. Warder presented a quantity of Japan Beans, and described their nature and value. They were introduced in the neighborhood of Cincinnati three years ago, and have been widely distributed. It is not a pea, nor a vine, but has a stiff, woody stem; the leaves, however, are broad, and are greedily eaten by cattle; the fruit is very abundant, and occurs in short pods containing two or three beans; these are oblong when green, but round when dry. They will not be valuable for table use when green, but may be found useful, when ripe, in winter, and as a summer or winter food for stock of all sorts, they may prove of great value, especially in the Southern States. They succeed well on all soils in which they have been planted. Their great value will be as food for cattle; they are easily threshed out when ripe. In planting, give them ample room; for the greatest effect, say at squares of three feet; cultivate as corn.

An invitation was presented from Mr. Glover, to visit his collection of models of fruits now at the Patent Office. The invitation was accepted, and a committee, consisting of Messrs. Worthington, Berkmans, Warder, Munn, and Richards, was appointed to report upon the same. This committee visited and examined the collection, which they found to be possessed of great merit, and which they hoped would be purchased by Congress, and that Mr. Glover should be employed to complete the collection

At some future period, a committee from the Pomological Society might be well employed on such a collection, in settling their synonimy, and thus effect a great work for the country.

The question of petitioning Congress to purchase Mount Vernon, for the purpose of making it the site of a National Experimental Farm, was discussed by Messrs. Tayloe, Calvert, Earll, Brown, King, and others, without coming to any definite conclusion.

At the evening session, on motion of Mr. Earll, the memorial of the Maryland State Agricultural Society, petitioning Congress to purchase Mount Vernon, for an Agricultural School, was taken up and read.

Mr. French, of Massachusetts, advocated the adoption of the resolution. It was carried, and Messrs. Blair, of Maryland, Earll, Brown, and King, of New York, and French, of Massachusetts, were appointed a committee to present it to Congress.

Mr. Browne, of Pennsylvania, made a report from the committee appointed to investigate Mr. Denton Offutt's system of animal physiology, from which it appeared that the party possessed wonderful powers over untamed animals; but the committee had not been able to understand enough of the plan to report favorably in recommendation.

Mr. Robbins, of Ohio, presented a memorial from citizens of Ohio, asking the countenance and patronage of the Society to a National Cattle Exhibition, to be held in September next, in Springfield, Clark county, Ohio, which was referred to the Executive committee. This body, at its meeting, agreed to act if the Executive committee of the State Board of Ohio do not dissent.

Hon. Mr. Benson presented a resolution, in behalf of Mr. Meacham, of Vermont, that a National Exhibition of Sheep be held in the course of the year, in the State of Vermont, at such time and place as the Agricultural Society of Vermont shall appoint.

There were several papers presented to the meeting by title merely, and referred for publication. Among these were a treatise on Hedging, one on Vineyards, and thoughts upon Flax culture.

Addresses were delivered by Dr. Warder, on the Culture of the Grape, with illustrations as to methods of training and pruning—by B. P. Poore, on the History of Agriculture, including Indian practice in the art, and by Dr. Eddy, on Bees and Bee Culture.

Mr. Benson read a bill now before a committee of Congress creating an Agricultural Bureau.

Mr. Calvert recommended the creation of an Agricultural Department, on an equal footing with the other Departments, the Secretary to have a seat in the Cabinet.

G. B. Browne, of Pennsylvania, spoke at length on the various propositions for Congressional aid, and gave his own opinions.

Mr. King, of New York, moved that the Society adhere to the resolution of last year, asking for a full Department; when it was determined by a unanimous vote, that this Society should continue to ask of Congress the establishment of a full Department in the government, to provide for the wants and protect the interests of Agriculture.

Nineteen States were represented by about one hundred delegates. The meeting was a good one, and must be followed by good results. Why does not the West, so deeply interested, send more representatives to this Society?

The Nominating committee reported the following names, which were unanimously elected as the officers for the ensuing year:

President—Marshall P. Wilder, of Mass.

Vice Presidents—Nineteen, (one from each State represented.)

Executive Committee—C. B. Calvert, John A King, A. L. Elwyn, J. D. Weston, B. P. Poore, A. Watts, John Jones, W. S. King.

Cor. and Rec. Secretary—W. S. King, of Boston.

Treasurer—William Selden, of Washington.

Pittsburgh Horticultural Society.

The names of the officers of the Pittsburgh Horticultural Society for 1854, are

President—Henry Woods.

Vice Presidents—James Wardrop, Robert McKnight, John Murdoch, Jr.

Rec. Secretary—Jas. S. Negley.

Cor. Secretary—W. H. Williams.

Treasurer—Adam Hersperger.

Columbus Horticultural Society.

The following persons were elected for this year:

President—Dr. I. G. Jones.

1st Vice President—Robt. Hume.

2d Vice President—M. B. Bateham.

Cor. Secretary—Henry C. Noble.

Rec. Secretary—H. B. Carrington.

Treasurer—Jos. H. Riley.

Garden Committee—Robt. Hume.

Council—Francis Stewart, Jno. Miller, C. P. L. Butler.

The meetings of this Society are to be resumed, and it is hoped will be attended with as much spirit and as good results as formerly.

Franklin County Agricultural Society.

To H. W. Clapp, Esq., are we indebted for a very well printed pamphlet of 100 pages, which bears this title, and which gives a concise and complete account of the doings of a very spirited Society. From the imprimatur, it appears to have been printed at *Greenfield*. So also it appears, from the Treasurer's report, that the money is kept at Greenfield; so also other towns are named as residences in the list of officers; but no where does it appear in what State of our Union is this particular Greenfield, and this particular Franklin county, located. Of the former, we have no less than twenty, and of the latter there are fifteen in the several States. Where is it?

Connecticut State Agricultural Society.

President—Samuel T. Huntington, Hartford.

Secretary and Treasurer—Jno. A. Porter, New Haven.

The Grape—The Vineyard.

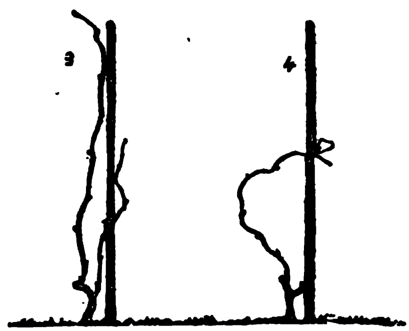
NO. V.—PRUNING AND TRAINING.

A considerable difference of opinion prevails among our vignerons, as to the proper time for winter pruning; some persons urge the performance of this operation just before the sap starts in the spring; others advise it to be done in the autumn, after the wood has fully ripened; while others recommend that it be performed during any *fine* weather through the winter. All, however, agree that it should *not be done* when the wood is frozen.

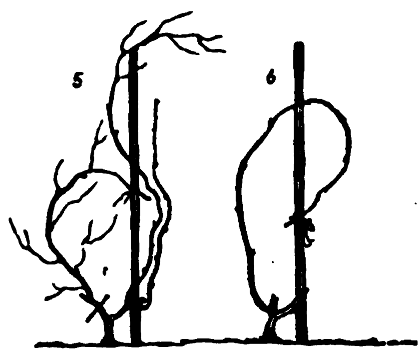
As a good deal of tact and judgment are necessary in this process, general rules only can be laid down, and every one must be guided by his own discretion. In trimming the vineyard, the first thing is to loosen the vine from the stakes, by cutting the old ties. Supposing that the stakes have been set in the vineyard, and the vines are of bearing age, they must be pruned according to the soil and the strength of the wood, and this will require the exercise of good judgment; if feeble, cut back the lowest good branch very close, and remove all others, and thus endeavor to secure strong shoots for the next year, but of course you must expect few or no bunches of grapes; if strong and healthy, select the largest and stoutest shoot, coming out as low down on the stock as may be, trim off all laterals and old tendrils neatly, and cut it off at six, eight, or ten eyes or buds above its origin; be sure not to leave a joint too much, as the results of over-bearin are very injurious to the vine, and indeed seldom furnish well-ripened berries.

The lowest and next best shoot is then to be selected for the *spur*, and it should be as low as possible; cut it back to two or three eyes, which are to furnish the canes for the next year; let the old wood of the last year's crop, and all extraneous shoots, be then cut off smoothly and close to the stock. See figures 3 and 4, which represent the trimmed vine.

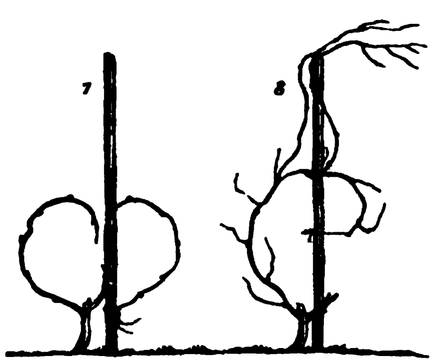
These directions are brief and concise, but, as before observed, great judgment is required, or the stock will become too long, as is represented in fig. 9, where the summer pruning has been neglected the previous season. Better lose the crop now, on any vine, than incur the risk of losing two or three crops by allowing the vine to become too high, which will require it to be cut back to the ground, or layered, before it can be again restored to a good shape.



These wood-cuts represent vines that have been winter pruned as above directed. In figure 3, the canes have been freed from the stake, and all tendrils and laterals have been removed, and they have been shortened-in, but the weaker of the two has not been cut off for the spur. In fig. 4, the spur is cut to its proper length, and the cane has been bent and tied into the form of the bow, the use of which is well understood by the vine-dresser, but may require an explanation here. The object is to cause the buds to break evenly, by equalizing the force of the sap.

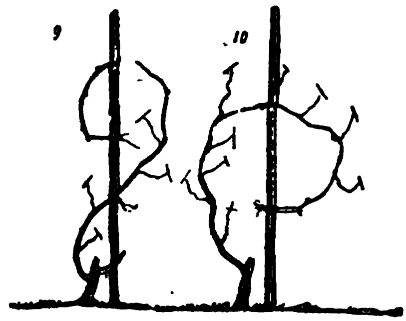


These figures are given to illustrate the winter pruning, and its dependence upon judicious summer pruning of the previous summer. Fig. 5 shows a bow of the previous year, which had been properly subordinated,



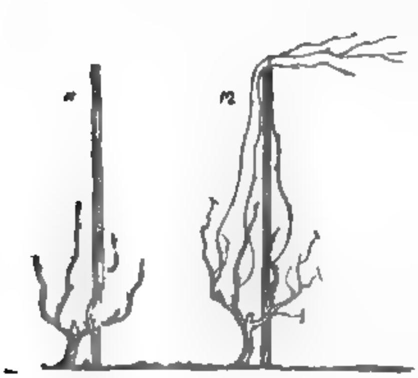
by judicious pinching-in of the fruit-bearing shoots, so that the whole wood-making force of the plant was directed to the two canes that issued from the spur; these are represented as being strong and vigorous, and devoid of lateral shoots. The straight line drawn across the base of the bow, is intended to indicate the point at which it is to be cut off, for upon the renewal system, adopted generally in our vineyards, the fruit-bearing wood is annually removed and as often renewed. Of the two canes, one is to be cut short for a spur, and the other of a suitable length to make a bow, as represented in fig. 6, where, however, the drawing indicates that too much wood has been left in the bow, unless the root be very strong. Fig. 7 is intended to represent another form, called the double-bow; it is a copy of a European method frequently adopted with strong vines; this plan is not so often seen as the single bow, and it is not recommended for general use; indeed, it should only be permitted in strong old stocks, as it is almost inevitably followed by too great a show of fruit.

Figs. 8, 9, and 10, are given to show the result of neglect in the summer pruning, and the mode of correcting the difficulty when trimming in the winter, if the vine be strong and the owner is unwilling to lose the season by cutting back the stock to force out new and strong canes for future use. These cuts are intended to be representations of the same vine: 8 shows that the buds at the top of the bow had been allowed to retain the mastery in their shoots, which arose from their superior situation, they being forced into top buds, and as their excessive growth was not properly checked, they grew strongly at the expense of the other branches, and especially to the detriment of the canes that should have been produced from the spur. Such a vine is very frequently met with in the winter pruning, for few persons realize the importance of early attention to the process of pinching-in, which is recommended in this paper to receive especial care.



Two plans may be pursued, as represented in figs. 9 and 10; in the first, all the laterals are trimmed in to a single eye, and a portion of the strong shoot is retained as a new cane, making a combination of cane and spur pruning, and the whole is used to construct the new bow, and bent so as to bring it within proper limits; the old spur is also cut in boldly, and great care is exercised to encourage vigorous renewal shoots or canes, for future use as bows the next season. The other plan is, at once to give up the renewal system for a while, and adopt the spur method; this may sometimes be found most advisable. In adopting it, the old bow is retained, and the side branches are cut back every year to a single eye. The objections to the system are, that it requires great watchfulness and care to preserve an equable vitality in the shoots, so that the foliage and fruit may be spread evenly; and beside this, the old wood is not generally so well adapted to the production of fruit as the vigorous young canes; then, again, it is necessary to lose a season whenever it may be found necessary to reproduce the bow, or main shoot as it would here be considered, for the bow or horizontal system of training should still be adopted. It should be recollected that these directions are particularly applicable to the vineyard culture of the

Catawba grape, to which they are known, by long experience, to be adapted. Different plants, with various habits, often require very different treatment and pruning. We have already discovered that the Isabella grape does not succeed well, as a general rule, under the treatment here advised; so, also, with the Herbemont, and some other very rampant growers, it has been observed that they need long pruning to realise their greatest excellence and heaviest crops.



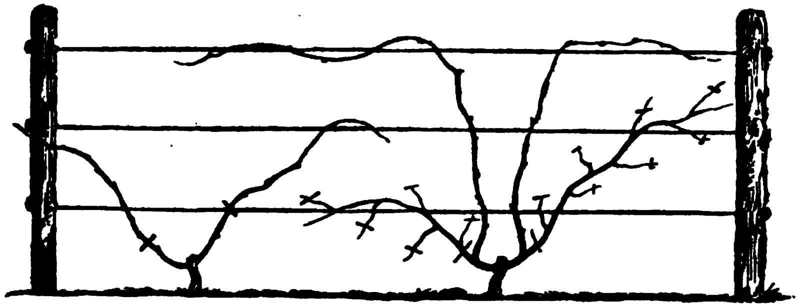
Figures 11 and 12 are given to illustrate quite another style of pruning, which is sometimes called the distaff or bush method. This is perhaps the most difficult of all, and requires the greatest exercise of good clear judgment in its management, and is, consequently, very seldom met with in vineyard culture. 11 is a view of the vine after it has received its winter pruning; the bush of nearly equal shoots produced the previous summer, has been thinned out to three or four of the strongest, and these are cut back, according to their strength, to two, three, or even six eyes, which gives the plant a sturdy appearance, and avoids the necessity of much tying to the stake. During the ensuing summer, great care is requisite, and the exercise of good judgment is called into play, in the management of the young shoots, which will be almost sure to spring strongest from the highest buds, and thus speedily make confusion in the distaff. These will need to be curbed, and the lower branches encouraged and tied to the stake for support—fig. 12. By a proper management of this style of pruning, a good supply of leaves is secured, and an abundant crop of well-ripened and well-distributed fruit; but the necessary care and treatment are so difficult to describe, and depend in each case so entirely upon the judgment of the operator, that it is almost impossible to instruct a common workman in the details, and the too frequent result will be a tall, straggling bush of naked and unproductive branches, with a constant tendency to extension upward, instead of the snug and tidy appearance of well grown bow and spur pruning, which is remarkable for its simplicity, and may be understood by all who have once seen it properly performed.

The next cuts, figures 13 and 14, are given to show the mode of pruning on trellis, whether of wire or of wood. The former material is highly recommended by some vinedressers, and the botanist, A. F. Michaux, received a gold medal from the government of France for his suggested improvements in the use of this supporting material; others consider it liable to injury by storms, and otherwise objectionable. The great merit of the trellis, when properly arranged, is the good exposure of the vines, and also the facility with which the attachments are made by the vine itself during the growing season, when no other ties are necessary than the natural claspers of the tendrils, and the elasticity of the shoots, gently twined about the wire. After the winter trimming, however, when all adventitious portions have been removed, it will be necessary to secure the branches in their proper relative positions upon the trellis, by the use of the usual ties.

The smaller vine in figure 13, is a stout plant of two years old or more, from which two branches have been grown the previous year. In winter these are to be cut off at the points indicated by the two cross marks, say at two, three, or four joints, according to the strength and vigor of the plant. From each of these spurs, during the coming season, one good cane is to be trained, while a little fruit may be allowed to perfect itself upon the other branches, which should, however, be pinched-in to keep them subordinate.

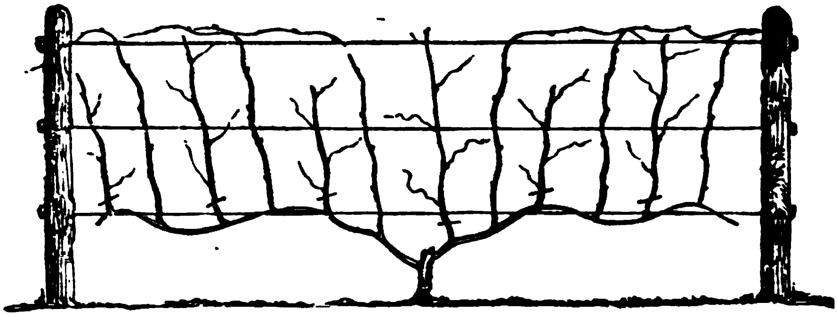
The next season these two leading branches are to be laid-in horizontally and secured to the wires, after all the surplus wood has been trimmed off. These bearing branches are trained horizontally for the same reasons that were presented for the bow training.

13



We should now encourage a vigorous growth of canes for the succeeding year, to come out from one of the lower buds or joints, or from a spur there provided at the previous winter pruning. During the summer, great care should be bestowed upon the pinching-in of all the bearing shoots, so as to force a vigorous growth into the two canes, emanating from the lowest eye on each branch: these shoots are to be trained up the trellis, their laterals pinched, so as to concentrate their growth, which may be allowed to extend along the top wire, to which they are easily secured by their own elasticity and tendrils. If successful in producing two good branches, as represented in the engraving, the next winter's trimming is merely a repetition of the last, the wood that has borne fruit is all to be removed at the cross marks just beyond the origin of the canes, when they are to be reduced to the proper length, according to their strength, and laid-in upon the lower wire. If, however, through neglect or accident, you have failed to secure two good canes, the spur method of pruning may be adopted with advantage, retaining the old bearing wood, with its side branches cut back to one or two eyes each; in this case, a little care will be required to encourage a cane to start low down on the branch, and to effect this it may be necessary to cut off and sacrifice one or both of the bearing branches, and make spurs of them, from which to procure good shoots.

Figure 14 exhibits a fully developed specimen of trellis training upon the *alternate* system. Two main branches are produced, and laid-in upon the lowest wire; the alternate buds are destroyed, or disbudded, to prevent crowding of the branches. These main shoots are gradually extended by laying-in a portion of the outer cane each year until the extent allotted is fully occupied. In the management of this method, it must be observed that while every alternate joint is disbudded, the upright shoots are also alternately *growing canes* and *bearing branches*, rising in parallel lines about a foot distant from each other. In the winter pruning of this mode of training, the bearing wood of the previous year is removed, close to the main leader, while the alternate, or cane of new wood, is divested of its tendrils and laterals, and shortened to the requisite degree, according to its strength, and laid horizontally so as to encourage a regular breaking of the eyes or buds, and then carefully raised and secured in its upright position, by tying to the wires; during the summer the bearing shoots which it produces are pinched-in, and a good cane is brought up the trellis from the spur left by removing the alternate branch which bore the last year. In this mode of training, great care and judgment will be required to preserve a proper balance of wood, so as to maintain a continuance of fruit. The idea is very simple and easily understood, but the practical application of this, as well as of many other simple principles in horticulture, will need an exercise of judgment, supported by common sense, in addition to rules. This method of training is well adapted to arbors and garden walks, and is introduced to show what may be done, rather than to recommend it for general application. To develop six bearing branches, and as many growing canes for renewal, will require a full grown



vine of vigorous habit, and this should have an opportunity of sending its roots far and wide into a rich soil, that should be appropriated to its sole use, and will also require the liberal application of suitable manure.

Training and Tying of the vines is an important operation, and should be performed at the end of March, or the beginning of April. After trimming, the canes are to be securely tied to the stakes, which should have been firmly driven into the ground before it settles too closely. The usual method is to bring the main stock against the stake, and secure it with an osier; the bow or hoop is then bent and tied where it passes the stake above, and if long enough, it should be brought back toward the stock, and there secured. Some train horizontally, whether on trellises, wires, or by simply tying the ends of the canes to the adjoining stake. It should also be observed, that a damp or wet day must be selected for this process, because the strain upon the branch, even in careful hands, will otherwise endanger the vines breaking where it is bent, and an experienced vigneron will give the cane a very gentle twist as he is bending it, and thus avoid the accident apprehended. Various modifications of training might be suggested, but these are left for the genius of each to suggest as he progresses in the work; security is the great desideratum, and is best attained by good tough willows.

The young shoots are rich in promise of fruit for this year, and wood for the next; therefore the vinedresser should be especially jealous of every intrusion, and provident against all injuries. To this end he must exclude all boys and dogs from the grounds, but he will frequently pass through the vines with the wisp of damp rye straw, cut into lengths of about twenty inches, and as fast as the shoots grow, he will tie them up to the stakes. This operation should be repeated every week or two; for the union of the new and old wood is so feeble at this stage of growth, that the least force will rupture the connection, and sacrifice the rich prospect. He will, therefore, constantly watch the protruding shoots, and secure them with the straw bands, which, like the osiers, are really twisted rather than tied.

During July, the long canes for next year will require to be trained from one stake to another. In this process the advantage of closer planting in wider rows, say six feet apart, by three in the row, will be apparent. The trellis, particularly that made of stout wire, will also be very convenient in attending to this duty, as the canes need only be laid along the top wire or rail of the trellis, with a little twist to sustain them until the clasping tendrils may secure their firm embrace. The fruit branches will also sometimes require support, as their burden increases in weight; though it is no disadvantage to the branches to let them lie even upon the ground. The rot is seldom found in fruit so situated, and it has been observed that such are often the earliest ripened bunches, which may depend upon the greater warmth at the surface sheltered by leaves.

Rubbing Out and Pinching.—The vigor of many of our native vines forces out an exuberant growth of the buds; three and more, often break out from each joint; as this would diffuse and weaken the growth, all

but one, the strongest, should be rubbed off with the finger, before they exhaust the vine too much. This should, therefore, be done so soon as the promise of fruit is sufficiently developed to be a guide in thinning the shoots. It will very soon be discovered that the topmost eyes or buds, having started earlier than the others, and receiving the greatest flow of sap, will be taking the lead, at the expense of their followers, as represented in figure 8. On account of the difficulty in the winter pruning, this must not be allowed, and is to be counteracted by early pinching off their points; but this must not be done too closely, for it is necessary always to leave at least two or three of the young leaves beyond the last bunch of grape buds, or "seed," as they are called by the vignerons; many persons advise leaving four or more leaves. At the same time, these, and all the shoots that are growing freely, should be tied to the stake with dampened rye straw, as already advised, to secure them from injury by wind, as they are very easily torn away from the stock. If the wire trellis be used, as shown in figures 13 and 14, no ties will be necessary but those provided by nature in the vine itself; the young branch is gently turned around a wire in such a way that its own elasticity preserves its position until the tendril has time to clasp the wire. Another plan is occasionally adopted, to save a long shoot, when the vinedresser does not happen to be provided with suitable ties; it is, to cut an oblique slit on one corner of the stake, and insert the tendril, which thus secures the vine very well, but this practice is not recommended except as a substitute for the straw band, and to be used in an emergency, for the vigneron should ever have watchful eyes, and must secure the young straggler, whether he be provided with ties or only his knife.

If the tender-hearted, or those who were anticipating hail storms and other injuries, failed to attend to the duty of thinning-out the superabundant shoots during May, let them see to their vines, ere the whole force of the season shall have been diffused among a great number of weak shoots, or, for want of guidance and direction, some of them shall have taken a lead in the wrong direction. As may have been inferred from the remarks upon winter pruning, this summer treatment of pinching is a very important matter; and much of the future success will depend upon judicious management of the vines in this particular. At the first examination of the vineyard, before the blossoming, rub out all weak shoots, and such as have no "seed" or prospect of fruit; also, remove the weaker, where duplicates appear; but observe specially to provide thrifty wood for the next season, and so arrange your summer pruning that two good shoots shall grow out from the lower part of the bow and stock, and endeavor to have these well balanced, one on either side. If, from any accident, your bow shoots are deficient, or if the stock, from previous neglect, have become too tall, now will be a good time to select the strongest shoot among those commonly called winter sprouts, which often come out from near the ground, and which should otherwise be entirely removed; this may be grown and encouraged for forming the *spur* in next winter's pruning. This method has been adopted with the happiest effect in an old vineyard, where, from neglect, the stocks had become tall, crooked, and ugly, and the result, at the end of a couple of years, has been an entire renewal of the vines, the old stems having been cut off below the surface.

Pinching-in is recommended for May, but must be continued through the season. If this process has been neglected before, or more especially, if it has been too severely practiced, the greater care will be necessary afterward, as in the latter case, the force of the vine will be throwing out laterals, to make up for the shortening at the points. This is a waste and misdirection of the strength, and may also be followed by injury to the vines. Do not, however, be too severe in your treatment of these laterals, and by no means break them out, as has been recommended by some. Shorten them in to one or two leaves, rather than to tear them out; the growing fruit needs shade and healthy leaves to elaborate the sap, and if the first crop of laterals be destroyed, the dormant bud will often be forced to start.

On the canes it has been advised to remove all laterals from the length of the wood that is wanted to be used next year; but it is considered best to leave all grow beyond this point, and never shorten in the long canes, as it is not necessary in our climate to secure the ripening of the wood of our native grapes. True, it has been and is still

the practice of many to shorten-in these branches during the summer, but some intelligent persons have been pursuing a different course, running into the other extreme, having observed, as they supposed, the injurious effect of too close summer pruning. Now there is reason in this policy, which commends itself to the favorable consideration of all vinedressers, who, being students of nature, begin to realize that there is really a *function* to be performed by the leaves of a plant, beyond the mere ornament and shade they provide; and close observers are also aware of the injuries that may happen to the first leaves from hail, the ravages of insects, and simple maturity; hence the policy of leaving more foliage upon the vines, to aid in the elaboration of the sap for the growing crop. There may be a time, in some situations, however, when it will be advisable to pinch-in the ends even of the growing canes of wood that have been laid in to supply bows for the next year's crop; supposing that *excess* of shoots and laterals have been broken out during the season, as before advised. The object of this pinching-in is to ripen the wood, if it continues to grow very late, and also to keep it from blowing about. At the same time the canes are to be tied to the stakes, to keep them in their places, as they may be much injured and broken by the wind, if loose.

The *early* summer pruning by shortening of the vines, has been already urged, but its importance must be the excuse for reiteration. No one should neglect attending to this important element of summer pruning, in its proper season, before the blossoming; for by such neglect the strength of the vine will have been uselessly expended upon many a shoot that must be sacrificed, or, at least, which will have been lost by not having been properly directed. The extreme end of the shoot may be easily removed with the thumb nail, and a change in the direction of the flow of sap is at once effected toward the canes destined for the next year, while the bearing shoots will receive an abundant supply for their own leaves to elaborate for the fruit. All vinedressers are not, however, agreed upon this early pinching-in. The blossoming is, by many, considered a critical period; and such persons advise that no work be done in the vineyard while it lasts, and especially they well advise that the bearing shoots be not shortened-in, as is too often done, close to the bunch. It is agreed, as stated above, that two or more leaves should always be left beyond the fruit. There is reason in this caution. If the shoot be vigorous, and have grown a couple of feet, it must have a considerable amount of sap flowing into it, and directed to the leaves above, which is thus suddenly thrown in upon the fruit, when the upper portion has been broken off too closely. If the summer pruning have been neglected to the time of flowering, it is recommended, by some, to wait until a couple of weeks after the blossoms have set, and then to attend to thinning the redundant wood, and especially to avoid leaving too much fruit.

J. A. W.

The Pear.

MESSRS. EDITORS:

In compliance with my promise, I continue my notes on the pear, as fruited and tested in my grounds. These notes I will follow up at a future day, if desired.

PETITE MUSCAT, or LITTLE MUSK.—This is a small round pear, light greenish yellow, often brownish red on the sunny side. A great bearer; fruiting in clusters, like the cherry. Worthless only for its early ripening, which is the last of June and first of July, according to location of tree.

AMIRE JOANETTE; Early Sugar, St. John's Pear, Joanette, &c.—A small early pear, chiefly valued for its early ripening. Round, somewhat pointed toward the stem, which is long and fleshy at the union with the fruit. Light greenish yellow, reddish brown on the sunny side. Flesh, white, sweet, and juicy, pleasant, but soon becomes dry and tasteless. It keeps several days after gathering. Ripe early in July.

EARLY CATHERINE, Rousselet Hatife, &c.—An old and early variety. Tree is long coming into bearing, when it produces immense crops, in clusters. Fruit small, pyriform, long curved stem. Greenish yellow, with a brownish red cheek on the sunny side. Flesh tender, rather dry, and not remarkable for flavor. Ripe, middle to end of July.

EARLY BUTTER, of Indiana.—This is a handsome fruit, of medium size, obtusely pyriform. Whitish yellow, sometimes a little bronzed on the sunny side. Flesh, white,

firm, but smooth and buttery, juicy and very pleasant. The tree is a long time coming into bearing, growth symmetrical, upright, and handsome, remarkably healthy. It is not identical with any variety I have received elsewhere. Ripe the middle of July.

JARGONELLE.—An old variety, formerly much esteemed; it is still desirable in large collections. Size, medium to large; pyriform, with a long neck and curved stem, which swells off into the fruit at its union. Color, greenish yellow, often brownish on the sunny side. Flesh, white, tender, very juicy, subacid, sprightly, and refreshing. Ripe, middle to end of July. Tree, a vigorous and strong grower, dark brown shoots, with large dark green foliage, and is a great bearer.

WINDSOR, or SUMMER BELLE.—An old sort, quite large and showy on the tree, but exceedingly deceptive, often entirely rotten at heart when most *attractive* on the *surface*. Bell-shaped, greenish yellow, tender and juicy. Sometimes quite good when eaten just in time, but it rapidly decays. Tree is of healthy and vigorous growth. Ripe last of July.

STONE PEAR.—This is of western origin; large, round, obtusely turbinated, and rather flattened at the crown. Yellow, with occasionally a scarlet dash on the sunny side. Flesh, white, tender, and juicy; excellent as a baking pear. Tree strong, and a great bearer. Fruit ripe last of July and first of August.

HUNT'S FALL BAKING, of Indiana;

HARRISON FALL BAKING, of Coxe;

CHELMERSFORD, of New England.—These three varieties much resemble each other, and also the stone pears, in quality, outline, and size; still there is a perceptible difference in the form of the calyx, stem, and time of ripening. The growth of the tree and foliage are very similar and show a common origin.

RED BERGAMOT, of Coxe.—An old variety. Medium to large size; round, flattened at both ends, brownish red, good for baking. Tree stout, and a vigorous grower; it is from ten to fifteen years coming into bearing, when it produces large crops, ripening in August.

MUSK SUMMER BON CHRETIEN.—An old and once highly esteemed variety, but now not worth retaining in a collection; size large, bell-shaped; yellow, with sometimes a bronze on the sunny side; sweet, but dry and deficient in flavor. Ripe the middle of August. Tree strong and spreading.

HAYEL or HESSEL.—Of medium size, round, light greenish yellow, numerously covered with russet specks; flesh sweet, with, however, a rough and puckery astringency, and without flavor. Unworthy of cultivation. Ripe the middle of August.

ORANGE BERGAMOT.—An old variety; large, round, turbinated and flattened at the crown; yellow, often very handsomely washed with light and dark scarlet on the sunny side. Flesh firm, coarse, rather astringent, and deficient in flavor; good for baking. Ripe middle to last of August.

BEURRE D'AMALIS.—A handsome, showy pear. Tree vigorous and a strong grower, and an abundant bearer. Fruit medium to large. Obtusely pyriform, inclined to narrow off rapidly from the middle to the calyx. Greenish yellow, often with a brownish, dull red on the sunny side, and numerously covered with small russet and dark green specks. Stem long, slender, curved, and often set obliquely to one side, rarely in a depression; calyx large and open, in a narrow, plaited, and sometimes russety basin. Flesh yellowish white, buttery, tender, and juicy, a little gritty near the core; sweet, but indifferent in character, hardly second rate. Ripe last of August, when it soon decays.

WENDELL.—One of Van Mons' origin; and named by Mr. Manning, in honor of Dr. Wendell, of Albany. Size, medium, round, obtusely pyriform, very even and regular on surface; light greenish lemon yellow, with a dark and mottled bronze on the sunny side, and numerously sprinkled over with small green and russety specks. Stem three fourths to an inch long, stout, thickest at the union with the branch, and the fruit often planted obliquely in a slight irregular depression; calyx prominent, partly open; segments short, and set in a narrow, shallow, and slightly ribbed basin. Skin thick and smooth; flesh white, breaking, and tender, juicy, and a little gritty near the core; sweet, pleasant, somewhat aromatic, but not very decided in character. Ripe middle to end of August.

BEURRE FIGUE.—A small pear. Round, slightly flattened at the crown. Greenish

yellow, with a thick, fleshy stem, and large, open calyx. Flesh yellowish white, very melting, tender, and juicy, with a sprightly brisk, sweet, and spicy flavor. Ripe the middle to end of August.

SUMMER FRANC REAL.—Medium size, round, slightly obovate, very regular on surface, greenish yellow, with sometimes a slight sprinkle of scarlet in streaks on the sunny side. Handsome and attractive on the tree, but decidedly indifferent in quality. It may prove better another year. Ripe first of August.

VALLÉE FRANCHE.—Medium size. Round, obtusely turbinated and flattened at the base. Whitish yellow, with rarely a blush on the sunny side. Flesh white, coarse, and quite deficient in flavor and character. Tree coarse, a rampant grower. Ripe middle of August.

OSBORN.—This is a native of the West. Size, medium to large. Round, obtusely-pointed toward the stem, greenish yellow, with distinct, dark, greenish specks over the surface. Flesh yellowish white, melting, tender, and very juicy; sweet, with a mixture of subacid, and delicately perfumed. Ripe middle to end of August. Tree strong and a vigorous grower, and an early and an abundant bearer.

MOON'S POUND.—Originated by Sinclair & Carr, of Baltimore. Size large, round, flattened at the calyx, and slightly diminishing toward the stem. Yellow lemon color, very tender, and abounding in pleasant juice. May prove a fine fruit. Ripe the end of August.

GROSSE CALLEBASSE. — Introduced from Europe. Large bell, or calabash-shaped, greenish yellow, with considerable russety shades about the basin of the calyx, which spreads in blotches over most of the lower part of the fruit; smooth, though somewhat angling. Flesh white, husky, coarse, dry, and deficient in flavor; unworthy of cultivation. Ripe last of August.

BLEEKER'S MEADOW. — A small, round, hard, and tasteless, unworthy fruit; unfit for any collection. I have fruited it for years, and never saw it any better. Tree a vigorous grower, and a great bearer. Ripe in September.

CALMAR NIEL.— Medium size; obtusely pyriform, light yellow, smooth, but somewhat angling. Stem short, calyx open and set in a moderately deep, ribbed, and slightly russety basin. Flesh white, tender, juicy, quite acid, but deficient in flavor; may prove better another year. Ripe in September.

BEURRE DE CAPIUMONT.—A most beautiful looking pear; size medium, shape very regular, long, turbinately pyriform; color yellow, with a brilliant scarlet cheek on the sunny side, and numerously covered over the surface with small russety specks; stem long and stout; calyx open and expanded; flesh yellowish white, firm, juicy, somewhat gritty at the core; sweet, with a mixture of astringency; perfumed, but hardly second or third rate, keeps well after being taken from the tree. Ripe first to middle of September.

RONDELET. — A small, round, greenish yellow pear. Unworthy of a place in any collection. Ripe middle of September.

BEURRE THOURY.—Imported from France some years since, under this name. Tree is a handsome, vigorous, and healthy grower on the quince and on its own roots. Fruit medium to large, round, mostly obtusely turbinated, smooth, and even surface, often with an irregular furrowed union with the stem, into which it sometimes swells; color greenish yellow, often with a light wash and dash of brownish red on the sunny side. Stem medium length, remarkably thick, fleshy, and knobby, sometimes set obliquely to one side of a plaited protuberance, and in a shallow, narrow depression; in other specimens, swelling out into the fruit. Calyx open, and set in a narrow, mostly shallow, and russety basin. Skin smooth and thin. Flesh white, buttery, but firm, juicy, sweet, with a little mixture of pleasant acidity. Ripe middle to end of September.

MARIE LOUISE.—A fruit much esteemed elsewhere. I have fruited it for years, and have never been enabled to discover its merits. Fruit above medium, often quite large; oblong pyriform, irregular or one sided, greenish yellow, which becomes yellow as the fruit matures; numerously covered and mottled with russety blotches. Stem long and curved, often set obliquely on one side of a lip. Flesh white, juicy, but hard and tough. Ripe middle of September. Tree is remarkable for its twisting, irregular growth.

PASSE COLMAR.—Medium to large size, oblong pyriform, greenish yellow, with some russety specks over the surface. Stem long

and curved. Flesh yellowish white, sweet, juicy, hard and tough. Tree with long, slender shoots; an early and great bearer. I have fruited it for years, and always found it indifferent. Ripe early winter.

Beurre d'Aremberg.—Medium to large size, oval, obtusely pyriform, greenish yellow at maturity. Skin thick, and more or less russety over the surface. A great bearer; fruit always perfect, but I have not succeeded in ripening it so as to be worth eating. Ripe early winter.

Beurre Easter.—Large, oval, greenish yellow. Buttery, juicy, rich, and fine. Keeps to midwinter.

Respectfully,

A. H. Ernst.

Spring Garden, Cin., April 3d, 1854.

Influence of Light upon Vegetation.—No. 1.

[This series of papers is possessed of great value; and will be appreciated by all who know their author, Mr. Paxton.—Eds.]

Every individual who possesses any knowledge of the habits and appetences of the members of the vegetable kingdom, or who has exerted himself in the slightest degree to ascertain and investigate the various relations subsisting between plants and the atmosphere, must be aware that the elements constituting that atmosphere, and which operate upon plants through its medium, exercise a most important agency on the various functions of vegetable life; and according as they are more or less adapted to the peculiar structure and constitution of individual plants, in the same degree they are deleterious or nutritive. It is a remarkable and interesting fact, that in their natural state, or that in which they spontaneously flourish, certain plants are only to be found in those localities wherein the state of the atmosphere, as it regards heat or cold, humidity or aridity, and several other elementary constituents which affect plants, is perfectly consonant to their peculiar habits, and supplies them with the requisite stimulus and nutriment to enable them to develop their flowers, mature their seeds, and otherwise propagate or multiply their species. It is also equally notorious, that when the same plants are removed from their natural situations, and placed in others where a due degree of those atmospheric principles is not afforded, the plants in consequence speedily languish, and ultimately perish; indeed, it is universally admitted, that though diversity of soil has a most extensive influence upon plants and vegetables, it can not be said to affect them so materially as variation of climate,—in which term we propose to include, in popular language and for practical purposes, the three leading particulars of light, heat, and moisture. With this conviction powerfully impressed upon our minds, we have been led to ask, "in what way can a knowledge of the particular influence of climate be brought to bear on horticultural science, so as to assist and direct the gardener in his endeavors to cultivate any plant or tribe of plants to the highest degree of perfection?" The answer to such a question seems obviously this: by teaching him to adopt the same treatment toward each individual plant or tribe of plants, which those plants receive from the bounteous and wise hand of nature in their wild and native state. When plants are introduced into this country from foreign parts, the gardener or amateur naturally inquires whether they were collected in tropical, temperate, or colder regions, and from the information he receives relative to this particular, determines whether to place them in the stove or greenhouse, or in the open ground; but he too frequently neglects to seek any further intelligence with regard to the humidity or dryness of the localities in which they are found, or whether they are most abundant in exposed situations or delight in shady and retired positions, where the more immediate rays of the sun never reach them. We repeat, that these points are too frequently neglected or overlooked by gardeners and others; and the consequence is, that a number of plants of the most contrary habits are crowded together in our stoves and greenhouses, and, as all receive the same or a similar mode of treatment, a few, to which that particular treatment chances to be appropriate, thrive well, grow vigorously, and produce their flowers in perfection; while the majority of them are found to maintain a sickly and unhealthy appearance, and after struggling for a longer or shorter period against adverse agents, or languishing for genial and beneficial influences, ultimately die off unexpectedly, and almost imperceptibly, without any apparent cause. With no tribe of plants, perhaps, is

this injurious and erroneous system more frequently practiced, or productive of more fatal effects, than with that large and highly interesting natural order, orchidaceæ. * * *

The first question which presents itself to our consideration, and to which we propose to restrict our remarks in the present article, is the extent to which stove plants are influenced by the immediate or mitigated agency of light upon them, and how the gardener may avail himself of what is already known relative to this subject, to cultivate any of these plants with increased facility and success. Few persons, we presume, are ignorant of the fact, that light is essential to the health and vigor, nay, to the maintenance of the vital principle itself in most plants; but whilst, with few exceptions, vegetable life would become extinct after a certain period of total seclusion from light, it is very certain that some plants require a much greater degree of the potent though subtle element than others; for, though many species seem to derive their very existence from the direct and vivid rays of the sun; there are numerous others which are incapable of enduring its more immediate influences. For instance, many of the plants now under consideration, when exposed to the full and unmitigated blaze of a meridian sun, lose all that healthy luxuriance for which they are remarkable; their foliage becomes brown and unhealthy, and even their growth is much impeded, or in some cases, wholly suspended. On the contrary, the effects of an insufficient quantity of light on those plants which require it in a greater degree, are manifested by their stems becoming elongated or drawn, and consequently weak or slender, and by the leaves assuming a white or blanched and sickly appearance; and if it is long withheld, either from natural or other causes, the plants will sooner or later absolutely perish. It becomes, therefore, highly important that, where plants from tropical or other countries are intended or desired to be cultivated in perfection, the true nature, character, or habits of those plants, with every minute particular relative to their original habitats, should be fully ascertained; indeed, without this knowledge, though perchance a general system of treatment may happen to succeed satisfactorily with some few of the many plants subjected to it, it may be regarded rather as a mere casualty, than as evincing any correct knowledge of the habits of the plants, or furnishing any justification of the absurd and injurious system of indiscriminate treatment; and we maintain that specific and rational rules, founded upon natural habits, actual experience, or botanical affinity, should invariably guide the gardener or cultivator in his treatment of plants. Still adhering, however, to the subject of light, we proceed to give a general and brief outline of the nature of such plants as will not only endure, but absolutely require, a great degree of solar light; and also of those which succeed best where some intervening object deprives them of the immediate rays of the sun. All such plants as are of a succulent or juicy substance, those in which viscid or resinous matter abounds, and those which produce a great abundance of leaves, and consequently expose a large extent of leafy surface to the atmosphere; all plants of this description can not subsist without a comparative intensity of light, and invariably inhabit those localities where a large supply of it is communicated to them. Again, those plants which are very porous, or are liberally furnished with organs of evaporation, and those which are nearly destitute of foliage, or have a tissue in which carbon scarcely exists, are generally found in retired and shady places, and abound most in the recesses of tropical forests, where, during the growing season, the direct rays of the sun are never exercised upon them, their ingress being effectually prevented by the dense foliage of the trees by which they are surrounded and covered. These general features are alone sufficient to guide the experienced and enlightened botanist in the cultivation of any tribe of plants, or individual species, with respect to the quantity of light necessary for them; but there are few gardeners who possess a sufficient acquaintance with physiological botany to enable them to determine, from the observation of the general appearance, or inspection of the structure of a plant, what degree of light is required to cultivate it to perfection. Therefore, this knowledge can only be obtained, either by a closer application to the study of this most interesting department of botanical science, combined with experience, or from the authentic accounts and reports of the persons who collect or

discover the different species; and these, not as regards the locality wherein an individual specimen of a particular species is found, but where plants of that species are most abundant, and in the greatest perfection.

A large proportion of the plants which now adorn our stoves, and more especially those interesting objects which are classed together under the denomination of "climbing plants," are inhabitants of the dense and almost impenetrable forests of tropical countries; where, except during the dry season, scarcely a ray of solar light ever reaches them. In these, their native localities, they twine themselves around the stems and branches of the trees by which they are shaded, and grow most rapidly and vigorously, sometimes attaining a truly gigantic size. Let but these facts be contrasted with the treatment they usually receive in the stoves of this country, and the reason why they never grow to any considerable size, attain to any degree of perfection, or flourish to any extent commensurate with their natural luxuriance, will at once be obvious. In our treatment of climbing plants, we usually train them to the rafters or roof of the stove, as if we were determined to pursue the most opposite system to that which nature enjoins. In their native localities, as we have before observed, they are never subjected to the immediate influence of solar light; but in the stoves of this country, they are generally placed in a situation where they constantly receive the most powerful rays of the sun, and indeed, in that part of the house where they are most exposed to its influences. Is it not, then, the hight of absurdity to expect that they will attain any degree of perfection in a situation so uncongenial to their natural habits? We experienced a most striking proof of the propriety of these deductions in our orchidaceous-house last season, where we planted out some climbing plants in the front border, in order to cover the roof, so as to render a less degree of shading necessary. During the summer season the plants grew and flowered in the most luxuriant and vigorous manner, and we were for some time at a loss to account for their astonishing and unusual exuberance; but it soon occurred to us, that the orchidaceous-house had constantly been shaded; and we have not the slightest hesitation in pronouncing this to be the only reason for the extraordinary luxuriance of the plants here alluded to. And yet, with a perfect knowledge of the facts above stated, relative to the natural habits of stove-climbing plants, gardeners and others will persist in keeping them as near as possible to the glass, so that they may receive as much solar light as possible. Our readers, we are sure, will unhesitatingly agree with us in condemning such a practice, as a strange inconsistency and a palpable absurdity, and we trust we shall prove it to be too gross and palpable to be persevered in any longer. Every person who cultivates orchidaceous plants, admits that shading is absolutely necessary to their existence; but, with the plants now under consideration, which are found in precisely similar situations, not only is shading deemed unnecessary, but they are actually employed for the purpose of shading others, as if they were themselves unworthy of any regard; when, in fact, they are among the most beautiful and interesting objects known in our collections of stove plants. If it be asked how such plants are to be cultivated, if they are not trained to the rafters of the stove, we reserve our reply to a subsequent part of this article, and proceed to state that "climbers" are not the only inhabitants of our stoves which require to be sheltered and protected from the fierce and powerful rays of the summer sun. No; the great majority of those plants to which we assign a place in the stove, are found in similar situations to those we have already mentioned, and consequently require the same degree of light or shade. Sensible of the importance of these facts, we recommend every cultivator of stove plants, who wishes to bring them to a state of perfection, to collect and arrange all those species of the description and habits now under consideration into one house, and to shade that house during the glare of the day, in the summer months, with some light and thin kind of canvas, similar to that which is now generally used for shading orchidaceous plants. By the adoption of this plan, we are convinced that much greater success may be insured in the cultivation of these plants than has been attained, and the difficulties attendant upon the cultivation of climbing plants hitherto experienced, would at once be surmounted and obviated, as they might still be trained to the rafters or roof

of the house, and likewise to the orchidaceous-house; in either of which situations, under such a system of treatment, they would be found to increase in size, and improve in interest and beauty, to a most surprising extent. There is, however, a portion of the objects comprised in the term "stove plants," which we have yet to notice, and which now claim a brief consideration; for, though the majority of them are of the description and habits above detailed, there are some which are of a totally different nature, and owing to the deficiency of solar light experienced by them in our stoves during the winter months, not a few lose their foliage, while others actually perish, and have, in some instances, become lost to our collections. To cultivate these in perfection, or even to keep them alive, it is quite evident that they must neither be treated according to the directions above given, nor be kept in a house in which climbing plants are trained to the rafters or roof, which would have virtually the same effect, depriving them of necessary light. It is, therefore, important that they should be kept in a house by themselves, and not only so, but that the rafters and sash bars of the house should be as small and slender as possible, in order that the light may not be obstructed, and that the plants may receive the full benefit of the sun's influences. They should also be placed on stages, and thus brought as near as possible to the glass, especially during the winter season. By thus dividing the collection into two parts or sections, a due degree of light and shade may be dispensed to each, as they may respectively require; and we feel assured, that much of the success or failure in the cultivation of stove plants, depends upon attention to this important particular. Our limits will not allow us to enter further into the subject at present, by considering the application of the principle to succulent and greenhouse plants; we shall, therefore, embrace an early opportunity of laying before our readers a few plain and practical remarks on the influence of light on succulent and greenhouse plants, and also in future articles take into consideration the influence of atmospheric heat and moisture upon plants; and endeavor to show that, if those points were more sedulously attended to by cultivators, we might then expect our collections to rival the vegetable grandeur and floral beauties of even tropical regions, by assimilating our system of management to those rules, which the infallible economy of nature teaches us to be most congenial to the habits and constitutions of the vegetable tribes.

Solar Heat.—No. 1.

The importance of the influence of the sun's rays upon plants is too well known to require any apology for the introduction of the following elaborate discussion of the subject, from the hand of a master whose teachings have long been received with profound attention. The subject is handled with ability, and at such length that several numbers of the Review will be required to present the essay, which is of such merit and value, however, that no injury can result from the separation of its parts. In its original form it occupied many numbers of "The Botanical Magazine."

It would scarcely accord with the character of this work, and the design of the present article, to discuss the question of the nature of heat. Whether it be indeed a substance, or merely a mode of existence,—a particular variety of form, or the vibration of rudimental atoms,—is far from being accurately determined. Believing that the majority of men of science incline to the opinion that it is an impalpable substance, and this hypothesis being likewise much more tangible and intelligible, we have adopted the mode of language which treats of it as such. Nor do we intend to institute any inquiry into latent heat, or the precise means of its development. We write on the subject for practical purposes, and solely with reference to botanical art and science. In this dissertation on solar heat, we shall, therefore, consider it as an active principle, noting the effects of its presence or absence upon vegetation, with applicatory deductions and illustrations; and the few remarks we may deem it necessary to make on its general laws, or the mode of its agency, will be as deferential and cursory as possible.

Heat—solar heat—is that great, undefined, and undefinable natural agent, which is the principal source of all the changes undergone by plants and vegetables, from the first germination of their seeds to the period of their actual disorganization and

decomposition. Being universally diffused, it pervades all their parts, and incites and invigorates their various functions when in health; but the moment disease and decay seize them, its apparent mode of operation is reversed, and it has a direct tendency to hasten their dissolution. In either health or decay, heat fulfills most important ends in vegetable economy; for, while in the one case it is the means of infusing life and vigor into what would necessarily be inert structures without its agency, in the other it prepares materials for the nourishment and support of succeeding generations, which are destined to flourish on the ruins of their progenitors and predecessors. These diverse effects of heat, although apparently attributable to two distinct and discordant properties, result from precisely the same cause, and are realized by a similar process; since, in either instance, the substance of plants is dilated and rarefied.

Heat expands all things; and when it appears to act contrariwise, such appearance is illusory. There may be only heat sufficient to evaporate the more subtle portions, and the residue may contract; but, in every case, there is an expansion and diffusion of invisible particles, this causing the visible ones to become more closely compressed; and, if the heat were more intense, the latter would probably be dissolved likewise. Heat evolves from the soil, rarefies, and then returns the fluid gaseous aliment of plants, which subsequently passes into, or is absorbed by, the minute orifices of the spongelets of their roots. Still influenced by caloric, this aliment is impelled and circulated throughout their continuous and ramified arteries, depositing, in its passage through stem, leaf, or flower, its grosser elements according to chemical affinity and assimilation; which deposit, by accumulation, is its actual growth or increase, while the rarer elements are constantly evaporated (by the continued influence of heat) through the innumerable pores. There is, thus, in a healthy plant, an unintermitting supply, appropriation, and expenditure; and as the supply exceeds the expenditure, so much is the appropriation, and so much is the growth. If the supply be suspended, or the plant unable to absorb it, or the circulation in any manner interrupted, and the plant debarred from appropriation; in either case the influence of heat is continued upon the plant's substance, expanding and volatilizing into the atmosphere its more fluid matters, while the earthy portion subsides, and eventually mingles with the surrounding soil.

Any derangement of the channels of circulation,—such as may be produced by a close ligature, by twisting the plant, by severing its stem, or a more inscrutable injury, — of course causes the gases which would have entered them to be dispersed abroad, and thus diverts the supply; while evaporation being unceasing, and its progress, in fact, facilitated as decomposition advances, the plant is speedily reduced to its component elements.

That the action of heat is alike indispensable to the growth and decay of plants, is further evinced by the fact, that, in a temperature below the freezing point, these processes are mutually arrested. Moisture, however, assists in promoting the decomposition of vegetable substances; but water is only a consequence of heat, at least in the form in which it is supplied to the earth. The progress of volatilization is accelerated or retarded, according to the degree of uniformity in which heat and moisture exist, either collaterally or independently, and the extent of alternation to which they are subjected. In a temperature uniformly high, with a commensurate supply of moisture, plants decay most rapidly; at a similar temperature, but in the absence of all humidity, the solid particles retain their texture for a great length of time; and in a lower one, under the same circumstances, still longer. In the latter case, alternations of moisture and drought will greatly facilitate the disorganization of a plant, but in the former they only impede its progress. Of the popular opinion that exposure to the atmosphere is necessary to induce vegetable decomposition, we may observe that, it is to a great extent erroneous. Air can have no effect, whatever, in either causing or hastening this process, except in so far as it is the medium through which solar heat and moisture are conveyed. Neither is the submersion of any dead vegetable substance in water at all effectual in preventing its dissolution, unless, as is the case in all natural bodies of water, by this fluid being considerably colder than the atmosphere. The fallacy of either of the above notions is easily demonstrated by

placing any part of a plant in a close vessel, filled with boiling water. If the water be kept boiling, and the supply replenished as it evaporates, the vegetable tissue will ultimately be destroyed, and its succulent portion, together with the water, be completely volatilized. This simple experiment proves incontestibly that heat and moisture—when the former is sufficiently intense, and the latter proportionably supplied—will speedily reduce all vegetable matters to a state of gaseous fluidity. Heat performs an essential office in generating those tiny mosses which first appear on newly-formed islands, mountain ranges, and architectural ruins; and, by the action of the same principle, these are converted into soil, successive tribes are produced in superior gradation, which likewise decay in their turns, and thus the surface of these barren districts is eventually clothed with both soil and vegetation, and rendered competent to sustain both animal and human life. As already hinted, all the food of plants, which is supplied to them either naturally or artificially, in the form of decayed vegetable or animal substances, is rendered soluble and qualified for absorption through the agency of heat. Aqueous aliment, which is a much more important article of vegetable sustenance,—whether absorbed in a pure state by the leaves, or percolated through soil,—is also primarily produced entirely by solar heat. The rains and dews which distill upon plants, and on which they ever depend for support, have their origin in the watery vapors constantly exhaled by the heat of the sun, which, passing into a cooler atmosphere, are condensed into various modifications of dew and rain, and being thus increased in density and weight, descend, by the law of gravitation, again on the earth. The most remarkable properties of heat are those of a diffusive and imponderous character. By the latter of these, it is enabled to pass unrestrainedly through the atmosphere, and permeate the densest substances. To the former we are indebted for that equability of temperature which is caused by what is termed the radiation of heat. This process is continually going on from all parts of the earth's surface, as well as from all substances, both solid and fluid, with which it is overspread. Hence, when, from the natural obliquity of the sun's rays, or from their total obscuration, the atmosphere is at a much lower temperature than the surface of the ground, heat is radiated from the latter, and from vegetation, to such an extent, that not only does the atmospheric vapor condense, but congeal upon them. Perhaps, also, the trifling evaporation caused by radiation from such bodies, may increase the quantity of hoar frost which is engendered upon humid ones during the spring and autumnal months, these being preceded in the one case, and succeeded in the other, by more intense and durable congelations. It is under similar circumstances, and entirely owing to the abstraction of heat by radiation, that ice is formed on the surface of water; while the incrustation thus produced, being a bad conductor of heat, is subsequently instrumental in preventing a like dispersion of heat from the lower strata. Different kinds of substances possess very variable capacities for absorbing, conducting, and radiating heat; these depending chiefly on the nature of their surfaces and texture: radiation and absorption being the transmission of heat to and from the atmosphere, while conduction is the communication of it to and from any other materials. In general, those bodies which are of the loosest texture, are the best radiators and absorbents of heat, since they admit the air to all their parts most freely, while those are the more perfect conductors which possess a substance of uniformly dense and compact nature. The extent to which any body acquires dew, when exposed to a clear and saturated nocturnal atmosphere, has been established as a criterion for determinating its radiating powers. This ingenious theory is based upon the fact, that, when vapor is brought in contact with any substance, in proportion as the temperature of that substance diminishes, to the same degree will the vapor be condensed, and adhere to it in the form of dew. All metals, particularly those with smooth and polished surfaces, are thus proved to be imperfect radiators of heat; while glass, and those substances which are of a very porous nature, are speedily deprived of heat when placed in a cold atmosphere. Most vegetable bodies radiate heat profusely; subject, however, to great variations, according to the nature of the fluids therein involved. Semifluids, such as oils and resins, dissipate heat much less freely than aqueous fluids; hence the different capacities of plants containing either of them for enduring cold.

The power of conducting or absorbing heat from contact with other substances, is seldom coëxistent and at the same time coextensive with the radiating power, but generally resides in the same body in inverse proportion. Substances with a dense continuous tissue conduct heat most rapidly, there being more immediate and uninterrupted communication between their particles; whereas, those which are more porous, admitting air, or being partially exposed to air throughout, radiate more liberally. The conduction of heat in porous substances is evidently obstructed by the irregularity of their tissue, and the interposition of minute vesicles of air, which, however, facilitate radiation; while from a denser substance radiation is far less extensive, but, by the contiguity and uniformity of its constituent particles, conduction is readily effected. Metals possess the latter property in a very remarkable degree, as is evinced by the rapidity with which they reduce the temperature of any warmer substance which is applied to them. Glass, on the other hand, is an extremely slow conductor of caloric, as are also wood and other vegetable matters. The capacity of any body for the absorption of radiant heat, varies materially from its capacity of absorption by conduction; the former being generally commensurate with its radiating power, since, in both instances, the heat is conveyed through the same medium.

An increase of temperature may be produced by a variety of means. Chemical combinations, friction, percussion, and electrical excitement, are the most effective of them; but the sun is the principal and most cogent natural source of heat. All other celestial luminaries appear to be either incapable of generating it, or are too far removed from us to render any emission of it perceptible from the rays which reach our globe. Indeed, the moon may be supposed rather to possess the power of attracting and abstracting it, for we have repeatedly remarked that frosts are most severe (and frequently occur only) when the moon's disk is visible, and particularly when she is in the latter quarter of her revolution. During the period immediately succeeding the spring and autumnal equinoxes, when the moon rises unobscured, in a calm atmosphere, after twilight in the evening, it is almost invariably accompanied by a greater or less degree of frost; and when it is not seen above the horizon till near or after midnight, this is still more frequently the case. Hence it is that many tender plants have been injured in the morning at this period, because the atmosphere was not sufficiently cold at night to induce the cultivator to protect them, he being at the same time ignorant of the above facts.

Now, we know that the absence of wind and clouds would alone facilitate radiation from the ground, and that the temperature of the earth's surface is always lower after midnight, on account of the prolonged absence of solar rays, and the protracted radiation; but the result of our observations is not confined to this period. On the contrary, we have noted the occurrence of the same phenomena when the moon was far advanced in the second quarter, and, consequently, when she rose before sunset. Frosty evenings at this period have very frequently been succeeded by rainy mornings, after the declension of the moon; while precisely the reverse has occurred in the latter stages of the lunar revolution. This hypothesis receives additional strength from the circumstance of frosts invariably being much slighter in those situations which are by any means shaded from the lunar rays; and which, by their distance from the bodies that sheltered them, can not be supposed to derive any heat from them, or to be at all assisted by them in retaining their temperature, otherwise than by their refracting the moon's beams. We do not, however, profess to assert this as an established principle, or one that is not liable, occasionally, to be departed from; but it certainly appears to us to be founded in reason, and supported by facts; it is, therefore, well deserving of the unbiased attention of the inquiring gardener.

Cold—the direct converse of heat—is by many ignorantly considered a distinct principle, or entity. So far from this being the case, it is merely the state produced by the abstraction or absence of heat; in fact, a consequence, and not a cause — a condition, and not a constituent. When we say, therefore, that certain plants are injured by cold, although the mode of expression appears to imply that cold is an active agent, we must be understood to mean that the injury is occasioned by the excessive radiation of heat

from their substance, on account of its distributive property. It will thus be perceived that the effects of cold are due to the withdrawal, and not the introduction of an element; and that the temperature of those bodies which radiate heat most rapidly, is more speedily reduced to the medium of the surrounding atmosphere.

From the general principles already premised respecting the agency of heat on vegetation, we proceed to specify a few of its more particular effects, interspersing our remarks with plain and practical hints relative to the instances in which their knowledge is useful in artificial cultivation. They may be comprised in three principal divisions, viz., the degree in which the geographical diversity of plants is affected by heat, the influence it exercises upon their functions, and the extent to which adventitious circumstances, such as elevated tracts, valleys, forests, extensive collections of water, &c., modify and regulate its diffusion and intensity. An inquiry into these several subjects will be, we conceive, not only interesting in a physiological point of view, but afford ample data whereon to attempt a system of acclimatizing plants, and supply authoritative basis for any future observations on the regulation of artificial temperature.

WHAT IS MANURE?—This question resolves itself into the stating of a great fact: *The farmer creates nothing; he only changes the form of what already exists.* Wheat, or any other plant, wool, beef, cheese, and butter, are nothing else than earth, air, and water in another shape. But the earth is composed of some ten or twelve substances; and that portion of it capable of being converted into a plant, at any one time, is comparatively small—about half per cent. of the whole — while air and water constitute the least valuable part. These three substances are the farmer's *raw material*, and out of them he must manufacture his grain. If his soil contains a very small quantity of matter capable of conversion into a vegetable, he receives a small crop at harvest time. A baker can make but little bread out of a nearly empty barrel of flour; but fill the barrel and he will make much bread. Let the farmer fill the earth with substances capable of changing into grain, and he receives much grain. Nothing can be more simple and yet more true, than that whatever we receive off our farms is but a portion of the soil, with some air and water, in a new form.

On the Growth of Fencing Timber.

At the Farmers' Club, of Wythe, Ill., B. G. Wright read a paper this winter, upon this subject, which will attract great attention in the prairie regions, although perhaps some may think his figures were dotted down by too sanguine a hand. After premising upon the necessity and advantages of Maclura hedges, he announces his subject to be the proof, that timber may be cultivated at a small outlay of labor.

From a pretty thorough examination of both planted and natural groves of timber, it seems to me that the proper distance would be five feet apart each way for trees intended to be cut at twenty years' growth, and half that distance, or two and a half feet each way, for trees to be cut at five or six years' growth. Indeed, from the appearance of our natural groves, it seems to me that this thickness is necessary in order to give an upward tendency to the young trees, especially to those which are to be left for rails. Any one who will give the necessary examination to this subject, will find that in our forests the proper amount of young trees seem, by a universal law, to die off as the larger trees outstrip them in growth.

I have locust trees fifteen years from the seed, which any one, upon examination, must admit will, in five years more, make five rails, or the proper proportion of rails and posts, to the tree. Now it will be found that ten acres planted in locust, five feet apart each way, will, at five rails and posts to the tree, make the incredible number of 80,000 rails and posts. Again, it will be found that twelve rails, eight and one half feet long, and two posts seven feet long, will make one rod of good post and rail fence. At fourteen to the rod, then 17,920 such rails and posts will enclose a farm of 160 acres, without any deduction for partnership fences where farms join, and divide the same into nine fields of about eighteen acres each, and leave timber for 62,080 rails and posts (more than enough to fence, in the same way, three other such farms,) for sale or fire-wood, as economy might dictate.

It will be granted that the stumps of either locust or chestnut will, in twenty years more, reproduce a much larger amount of timber than the first twenty years' growth. Hence, we have a never-ending supply of timber from the same planting. Instead, however, of planting five feet apart each way, I would plant but two and one half feet apart each way, for the purpose of cutting out, at five or six years' growth, three fourths of the young trees for making picket fence. For, in five years, judging from a locust grove, of four years' growth, on the farm of Mr.

Taylor, of Mercer county, Illinois, there can be no doubt that these extra trees would make three pickets, seven feet long, to the tree.

Thirty trees to the rod square (which is three fourths of what it would grow at two and one half feet apart each way,) would, at three pickets to the tree, be about ninety to the rod, or 154,000 pickets as the product of ten acres.

At forty pickets to the rod, which is close enough to stop all stock but small pigs, 61,200 pickets would enclose, and divide into eighteen acre fields, one farm of 160 acres, and leave a surplus of 92,800 pickets for sale or fire-wood. Thus it will be seen that a little more than one third of the pickets grown, in five years, on ten acres of land, will inclose and divide with a good picket fence, into eighteen acre fields, 160 acres of land, and yet leave timber enough to make, at the expiration of twenty years from the planting, 80,000 rails and posts. But this is not all. The 92,800 pickets left, after fencing the farm as above described, would, at the low price of thirty cents per hundred, very readily sell for $279—a sum fully half as large as most farmers can realise in five years, for all the corn they can grow on ten acres of land. But there is yet another item of remuneration for the culture of these ten acres of timber not to be overlooked. For, as before shown, there would be left for sale or fire-wood, at the end of twenty years, timber for 62,080 rails and posts, which, at two dollars per hundred, would be the further sum of $1,240—making for rails, posts, and pickets that might be sold, a total of $1,519. This amount is, for the twenty years, seventy-five dollars per annum, but twenty-five per cent. less than the probable yield in corn at twenty cents per bushel.

But here it may be said, provided the above calculation is correct, that, if every owner of 160 acres of prairie would plant ten acres of timber, the price would soon fall below the above estimate, in consequence of the demand not reaching the supply. This is, perhaps, true; but if so, gentlemen, this very result is, after all, the grand desideratum to be accomplished—a result which would bring into rapid cultivation the immense and fertile prairies of the "Great West," and make her farmers, by means of river, canal, and railroad transportation, the unrivaled competitors for supplying the markets of the world with bread and meat.

Illinois, with 44,000 square miles of coal field, (twice as much as Virginia, and more than Pennsylvania, Tennessee, and Ohio put together,) has nothing to fear on the score of an inexhaustible store of fuel; and if we can but secure the means of fencing, it needs no seer to foretell the exalted position which she is destined soon to occupy among her sister states, whether old or young.

If, however, ten acres shall be deemed too extensive an experiment in the cultivation of timber, or if there is, on the other hand, any fear of having the supply too great for the demand, then let each owner of 160 acres of prairie, who has no division fences, or timber to make them, plant in locust but two and one half acres, at the above given distances, and, if cultivated as well as corn generally is, for two or three years, he will, in five or six years from the planting, have timber for more than enough pickets to divide his farm of 160 acres into nine eighteen acre fields; and at the end of twenty years he will have timber for 20,000 rails and posts—2,060 more than enough to replace all the fence on his farm, supposing it to be fenced in eighteen acre fields. The question here naturally arises, will small locust pickets last long enough to be worth cultivating?

My own experience, and I have no other, is very limited. I have small locust stakes, about a good size for pickets, now the third year in the ground, and not yet sap-rotten. And from this fact there can be but little doubt of their lasting seven years in the ground. And if so, by being cut seven feet long, they would, after rotting off twice, be long enough to drive the third time, and thus last for twenty-one years, or till the timber left for rails and posts should be ready for use, as previously demonstrated.

But supposing this calculation of timber to be three fourths too great, still we have, as the product of ten acres, what I have estimated as the yield of two and one half acres. And even at this low rate, the advantage seems to be decidedly in favor of cultivating ten acres of timber for the purpose of fencing and keeping fenced 160 acres of land, in preference to depending on the purchase of scrubby timber, at from one to ten miles distance, for the same purpose.

In conclusion, let me say to the members of this "Club," that I am so thoroughly convinced of the entire practicability of cultivating timber to profit, that I intend, the ensuing spring, to plant in locust, chestnut, and walnut, some ten or fifteen acres, on a tract of land in Rock Island county, Ill.

It is true, these picket fences are not much more ornamental than the worm fences, but being straight and not zigzag, they will occupy much less room; and even a picket is a cheering sight and a good protection in an open prairie, even when made of oak saplings, as I myself can testify. They will at least protect a young hedge, which, if of Maclura, will be ready to take its place by the time it decays. Even locust saplings will not last very long.

I should not recommend planting the forests so closely as advised by Mr. Wright, but should prefer the plan pursued by my friend Whitney, of Franklin Grove, and others in Illinois, where the locust groves struck me as among the pleasantest products of the prairies, evidencing the prudence and forethought of the pioneers of that glorious country. The plan is this; after breaking a piece of prairie appropriated for the grove, a tenant is found who will plow it in the spring and plant it to corn, allowing the proprietor to plant a tree in every alternate hill of every alternate row, or eight feet apart. The cropper is allowed two partial crops of corn in consideration of his tending the ground among the trees for two seasons. By this time the locusts occupy the ground with their vigorous branches and hungry roots; they have got a good start, and will thenceforward take care of themselves, and smother the weeds.

From my observations there and here, I am well satisfied that in many of our broken lands, at least, the timber will be worth more than the rent-corn in a period of fifteen years. The attention of farmers who have hillsides and ravines in their possession, is earnestly directed to this subject, even in a timber country, as the demand for locust timber will increase with the advance of railways, telegraphs, and other civilizers of the age. My prairie friends in Illinois, Wisconsin, Missouri, and elsewhere, will not be slow to appreciate the advantages of such a timber lot as Mr. Wright urges them to plant, and may also be induced to act upon the suggestion of the "Old Doctor," and plant other trees, including, of course, the evergreen varieties. The *Iowa Farmer* also keeps the subject before its readers, and will do good if it persuade one person to engage in this important branch of agriculture.

J. A. W.

Beet Root Sugar.—The sugar used in France is manufactured, as is well known, for the most part from the beet, and 160,000,000 of pounds of beets were used last year in its production. Of this, 16,000,000 were converted into alcohol. By means of recent discoveries, great improvements have been made in the manufacture of sugar, there being less waste and a purer sugar. The present price of sugar is sixteen sous the pound; of alcohol, 32 sous the pint; both of which pay a very heavy tax.—*Farmers' Club.*

Architecture an Art.

BY J. R. HAMILTON.

It is striking even to the residents of our city, but must be perfectly wonderful to the eye of a casual visiter, to mark the feeling for the fine arts which is growing up among us, if it has not yet had time outwardly to develop itself to any great extent. Architecture, painting, and sculpture—arts which but a very few years ago had scarcely a passing thought bestowed upon them here—are now becoming the pride and study of every person of cultivated intellect and refined feeling. Sculpture, which has hitherto been considered necessary only for making peoples' busts, is about to be introduced by our architects in the decoration of their buildings—that beautiful blending of two sister arts which has shed their chief glory upon the architectural productions of Italy. Painting again may truly be said to be on safe ground, when we see the *ladies* of Cincinnati, from the retirement of their domestic hearths, reading so noble a lesson to our inhabitants as appeared in the beautiful address from them which graced our public journals of April 12th. Aptly do they quote the saying of a profound thinker: that art is the "Handmaid of Religion," and that "by infusing a love of the beautiful, the fine arts have a tendency to disgust the mind with the deformity of vice, and though not always tending to the practice of virtue, they at least tend to the admiration of it."

Then as far as architecture is concerned, mark the singular changes of the past few years. From the log hut of only sixty years ago, our city has passed rapidly through the gradations of insignificant frame and brick buildings, until our public and private residences already bid fair to rival, in costliness of decoration, any thing to be found in the older cities of the Union, and probably, in a short time, even the most majestic structures of Europe.

If we go to the environs of our city, and follow our citizens home to the delightful and sequestered haunts which many have selected as an asylum from the cares and anxieties of daily life, we see there the same *desire* for the beautiful pervading all their residences, from the costliest villa to the simplest cottage. It is true that in many, very

many cases, they have lamentably failed in their object; that by the employment of unskillful artists, or perhaps no artist at all but their own imperfect notions, they have, many, at a vastly increased outlay, succeeded in putting up buildings that mar instead of beautifying the sweet localities they have chosen; but this is all in the right direction; it shows that with the increase of wealth is growing at least a feeling for devoting a portion of that wealth to one of its most ennobling and legitimate uses—the cultivation of the fine arts, and consequently of refined feeling and good breeding in the community at large.

Looking upon our favored locality in this state of transition, with its rapidly increasing wealth, there is perhaps no city or state in the Union where it becomes more imperative to diffuse at once and widely the principles of good taste. The true appreciation of architecture is, after all, but a cultivated feeling, pleasing in its results, but to be arrived at only by those who have made it their special study, like any other of the fine arts. For this reason, a man, however able in any other pursuit of life, may be entirely at a loss when dealing with objects of beauty, even in so simple a matter as the arrangement of a small private residence; and he is as capable of having his mind perverted by the influence of distorted and unsightly models constantly before his eyes, as he would be of having his taste really cultivated if accustomed always to look upon nothing but models of genuine excellence.

Perhaps no man ever lived, whose individual labors have done more to diffuse a love of correct taste, both by writing and in practice, than the late lamented A. J. Downing. The effect of his labors on this continent have been little less potent and magical in overthrowing preconceived notions of false, and laying a substratum of genuine taste, than those of the celebrated Pugin, who, single-handed, in England, branded and uprooted by satire the ridiculous caricatures of Grecian temples, which for a long period flooded that country after the appearance of Stuart and Revett's able work upon Greece. Downing's work should be in the hand of every man entertaining any appreciation of architecture as a fine art. The public generally, have cause to lament in him the untimely sacrifice of a truly valuable life, while every architect grieves in him the loss of one who had long striven so nobly and so ably to plant their profession in the proud position to which it is entitled.

But while recommending Downing as an author to those who may not be acquainted with his works, and anxious to see his principles diffused broadcast through the country, it would be well to urge that those very works be not made the instruments of perpetrating productions at which the eye of Downing would be more shocked than any other, could he behold them. Works like his were never intended, as many imagine, to make "every man his own architect." They do no more than enunciate general principles in writing, illustrating fully his remarks by pictorial representations of the various styles adapted to rural architecture, both to the exterior and interior of buildings. Here, however, his aid necessarily ceases. Had he written a thousand books, he could not have occupied so wide a field as the entire range of domestic wants, varieties of site and aspect, and all those nameless individual accidents and peculiarities which will always belong to every separate plot of ground in the country, and to the individual wishes of every person desiring to build.

This is the point at which a proprietor needs the aid of a skillful architect, unless, indeed, he has had the opportunity (which few could possess) of so having studied the art as to be practically an architect himself. Before a stone is laid, before the very position of the house and drives have been determined, the eye of an artist, if he be required at all, should be called into operation. To call upon him to patch up the front of a building, which by its very disposition of *plan* and occupation of the ground, is bound to be ineffective or unsightly, is to seek a physician when the patient is at his last gasp. I have in my own practice been called upon often to *design* a house, the *foundations of which were actually laid.* The idea is simply absurd. Not unfrequently the contemplated arrangement has been so egregiously bad, and would have proved so unnecessarily costly, that I have gratuitously gone beyond my instructions, and succeeded in inducing my employer to tear up his old foundation, merely by putting in contrast before him what he was going to hav-

with what he *could* have, at even a less cost.

On the other hand, to seek the aid of the mechanic, as is so commonly the case, and to act upon his suggestions *before* consulting the architect, is equally fatal, unfair to the exertions of a professional man, and the fruitful source of many of the architectural failures (as to beauty, at least,) which abound in every direction. It surely needs no argument to prove that, taking two men of equal ability—one a mechanic, and the other an architect—that the latter should know more of his own business, as the former does of his. There can surely be nothing derogatory to a mechanic in saying, that a man who is devoting his whole life exclusively to the proper disposition of building, and evolving forms of beauty, should be more skillful at the operation than one who can snatch but a little time for such studies, from the management of his tools, machinery, and workmen. In this respect, it matters not how skillful a mechanic may be at his trade, he can not intuitively and at haphazard know what other men have to take long years of study to acquire.

Let no mechanic who reads this page imagine I am penning one word to militate against his interests. I am only endeavoring to uphold an art which has hitherto been, and is still, too much degraded among us; and the truly good mechanics, (among whom I reckon many of my most valued friends,) will learn, if they do not know already, that it is only to those who think as I do, that they can look for proper aid in their labors, and for increasing the demand for their useful avocation. On the other hand, I would entreat the general reader to give me credit for the singleness of purpose with which I pen the remarks that I know run a little counter to ordinary practice. My object is purely to uphold the noble art of which I am a humble member, apart from any merely selfish motive; and I am the more urgent in the matter because I know of no large city in the world where the labors of good architects are more needed, and less understood or appreciated, than this.

If any one needs illustrations of what I am advancing, let him go out in any direction from this city, and see the dwellings occupying some of the loveliest spots it is possible to conceive. Only look at the specimens of what poor Downing has nicknamed the "temple cottage," and the "cocked-hat" cottage! How could such things have ever been perpetrated by any qualified architect, by any man who had studied even the rudiments of rural architecture? Some of them, too, doubtless stolen from the pages of Downing, but so caricatured that he himself would never have recognized them as his imaginings. A witty friend of the writer, while standing before a house of this class, bristling with brackets, gables, and points, like a magnet dipped into steel filings, was asked proudly if he did not like "Gothic." "Yes," he replied, "I do; but I hate Vandal." I can not resist sketching these pretty things in Downing's words.

"The TEMPLE COTTAGE is an imitation of the temple of Theseus or Minerva, in thin pine boards, with a wonderfully fine and classical portico of wooden columns in front. The dimensions of the whole building may be twenty to thirty feet. The grand portico covers, perhaps, a third of the space and means consumed by the whole dwelling. It is not of the least utility, because it is too high for shade; nor is it in the least satisfactory, for it is entirely destitute of truthfulness: it is only a caricature of a temple—not a beautiful cottage.

"The COCKED-HAT COTTAGE is, perhaps, a little better, for it is an imitative exaggeration, not a downright caricature. This species of cottage has grown out of an admiration for the real and intrinsic beauty of the rural Gothic cottage, of which *gables* are strongly characteristic features. But some uneducated builders, imagining that the whole secret of designing a Gothic cottage lies in providing gables, have so overdone the matter, that, turn to which side of their houses we will, nothing but gables salutes our eyes. A great many gables in the front of a Gothic villa of large size may have a good effect; but to stick them in the front of a cottage of twenty-five feet front, and not content with this, to repeat them every where else upon the roof where a gable can possibly be perched, is only to give the cottage the appearance, as the familiar saying goes, of having been 'knocked into a cocked hat.' A journey among the attic sleeping rooms of such a cottage is like that geographical exploration of the peaks of all the highest

mountains, made by beginners in a corner of the map of the world." Had I gone to several places in the neighborhood with a daguerreotype machine, I am sure, reader, you could not have a more faithful picture.

And what has this to do with rural architecture? It has every thing to do with it. It goes to prove that success can only be expected where it should legitimately be sought. It shows that there can be no such thing as a stereotyped edition of a gentleman's country residence; that mere book knowledge does not always qualify a man, however otherwise able, to devise forms of beauty adapted to his individual requirements; and it further proves that in nine cases out of ten the mechanic, however skillful, can afford him no assistance in the matter; nor should such a man, from the very nature of things, be expected to do so. I urge it, because, if our buildings are to be monuments of taste instead of deformity, if our rural residences are to administer to the wants, and gratify the refined tastes of their possessors, we should seek success at the very fountain. All the books that Downing ever wrote, all the suggestions of gifted minds that have been handed down to us, all attempts to cultivate art, indeed, is little short of useless, if we neglect those who have to study and practice it; if we refuse to place the profession of an artist upon its true and legitimate basis.

The Introduction of British Song Birds.

A paper was read from Mr. Hooper, Actuary of the Brooklyn Institute, describing an effort which had been made to introduce into this country some of the English feathered songsters. Greenwood Cemetery had been fixed upon as their settling place, and a number of sky-larks, wood-larks, blackbirds, thrushes, and goldfinches, had been imported. They regularly returned to their cages for their food, and it was hoped would remain and increase and multiply in their new abode. The experimentalists argued success from the fact of some larks, brought fifteen years ago to Long Island, having regularly returned in the spring, and only left by reason of the brick and mortar encroachments, when they settled at East New York, where several are now to be seen and heard in full song.

Pears on Quince Stocks.

Mr. Saunders is a Jersey nurseryman of long standing; and as to evidence concerning pears, who shall despise Jersey advice, especially if emanating from such a quarter?

I at once return Mr. Saunders the compliment he paid me, "of learning something from my remarks." Indeed, as to myself, I scarcely ever entered a garden, however mean, or read the opinions of another, but I learned something, and many a gray-headed veteran will confess the same. I, however, profess not to review the system of culture laid down by Mr. Saunders, which, (taken as a whole, and considered as referring to the Channel Islands, and, perhaps, our more southern counties), is, doubtless, up to the mark, yet will, I fear, scarcely be found applicable to our northern counties.

My chief business in this paper will be to examine into the quince stock question, and in doing so, I must, as in duty bound, pay more heed to the general question than to individual opinions; therefore, to those of my old friends with whom I may have the misfortune to differ, I merely say, please to bear with me.

We must not, however, in discussing matters like this, beg one-half the question; it is all very well to say, "where the soil is suitable, &c.," but the great misfortune is to have to grapple with *unsuitable* soils. Certainly, any first-rate gardener, with all appliances, may work wonders; he may make a dry soil moist, a wet soil into a dry one, a poor into a rich one, a tenacious or stubborn soil into one of the utmost pliability. But those who cater for the majority, although occasionally they may, or try to, write up higher principles than thousands have the means of practicing, yet must, after all, show to numberless smaller and less ambitious gardeners how they may, without extra cost, attain a respectable amount of success.

I am glad to have my long-formed opinion better confirmed by so able a person as Mr. Saunders. The opinion, that as a groundwork to the extension of the quince stock, it is absolutely necessary that the soil be adapted *to the quince itself;* the recognition of this principle, if it be correct, can alone, as a foundation, support a good superstructure. Well, then, this admitted, I would ask those gardeners of great experience, who have conducted matters of this kind in four or five counties in Britain, wide apart, in how many they have seen the quince thriving to their entire satisfaction on unprepared soil.

As to the free stock; we find pears, in all quarters, and on soils widely differing, generally thriving as to the principle of growth. I had some of the newest pears from Mr. Rivers, about four years since, all on the

quince, from which I was led to expect great things, but they have turned out a complete failure. I had selected with a view to enlarge the amount of late or heavy kinds, adapted to inferior climates. They were planted carefully against a wall having an eastern exposure, and the soil prepared in a way, as I thought, adapted to the quince, but they have not grown a foot since I obtained them, and they look as if they would never cover the wall. A neighbor of mine, a reverend gentleman, who takes a delight in his garden, had several of the newest kinds on the quince, about the same time, and I have heard him express much disappointment over his little fancy trees. Now the soil, in general, about here, is rather sandy, and in the two cases I have quoted, the subsoil is dry, doubtless too dry; and I think it just to mention all these little things, inasmuch as my object is by no means to lessen the desire for the quince, but merely to sharpen peoples' wits, and to make them proceed with caution, in order to lessen the chances of future disappointment, and to lead to the possibility of one day placing the question on a sure and well-ascertained foundation. I doubt not that Mr. Saunders, whose urbane style is, I think, unmistakeable, will excuse my thus handling the quince rather roughly, and for proceeding a little further with this most interesting, although perplexing question. Mr. Saunders quotes Cornwall, Devon, Somerset, Hants, Essex, Suffolk, as likely counties for the quince: a goodly array of warm quarters, to be sure; but then, what are they to all the remaining counties in England; to say nothing at all, for the present, of Scotland or Ireland; for folks there love a mellow pear, and have and desire to enjoy the product of *their own little gardens*.

I have for years, urged the importance of soils of an alluvial character; and that if not so, that character must be imitated, if success is expected. Here I find, with much pleasure, Mr. Saunders and I meet; he says,—"*Very dry soils, in high situations, will not suit.*" Now this, if confessed, at once points to the severity of limits imposed on the quince stock, or to such highly artistic and expensive proceedings as will ill suit the general conditions under which the thousands of small gardeners scattered over the kingdom are placed. And if so, how is it that our great nurserymen, who have made a good thing of the pear propagation, never informed their customers of so great a fact?

Mr. Saunders speaks of using sea-sand, lime, and salt, in a compost for pears on the quince. I have little doubt that the advice is judicious, as regards the sea-sand and lime, and probably it has been found wholesome practice with our friends of the little isles, who, having such things at command, and close at hand, have doubtless tried them repeatedly. Moreover, I have ever found that the quince thrives best in a soil that is close and fine in texture; in fact, in one that would be called, by old practitioners, unctious; a broad term, to be sure, for our adhesive loams will fall under this head. It is not, however, a matter of loams, for loam alone may not settle this question. There is a character of soil, well known to gardeners, of a darkish, fatty character, that is somewhat moist in almost all weathers, and yet not wet, which is rich in some kind of humus or organic matter, and which, indeed, our Johnstone, Ways, or other celebrated agricultural chemists would better define than I can. This kind, I say, is the thing, in my opinion, for the quince. I do not say that it is the only kind in which the quince will thrive; I know better; but it is the kind of compost that I would advise those who are highly interested in the question to imitate; and if the subsoil, at about a couple of feet below the ground level, possesses a permanency of moisture, not wet, why, I verily believe that all the conditions requisite for the pear on the quince are present; the climate overhead being tolerably propitious or improved by a well-judged assiduity.

But now, I must just beg to take another glimpse at Mr. Saunders' most interesting paper, one which is, indeed, highly suggestive. Mr. Saunders heads rather low on the stock in order to plant low; and others call into action the fibers from the graft or bud, as well as the roots of the quince; for, as he justly observes, such a course will cause fibers to protrude. About the propriety of this, under the circumstances Mr. Saunders quotes, I have not the slightest doubt; but is not this almost tantamount to expressing a doubt about the powers of the quince stock? I now fear that I have an unpleasant duty to perform, and that is to say, that I must disagree with Mr. Saunders, when he says, p. 285, "All the varieties do not equally well on quince bottoms, but the exceptions are very few."

This affirmation, I have little doubt, will be found correct as to Jersey, Guernsey, and the southern counties of England, but surely this is taking too narrow ground for the whole question.

Mr. Saunders fully recognizes, in the case of the quince stock, the immense utility of top-dressings, or, in other words, the encouragement of surface-roots. Our readers, who have been acquainted with THE COTTAGE GARDENER from its earlier period, will, doubtless, remember, that in all the advice I have been called upon to offer, as to hardy fruit culture, I have ever persisted in the propriety of encouraging surface-roots by a *systematic* and *periodical* procedure.—*Cottage Gardener.*

Forest Trees from Seeds.

One of our subscribers requests us to furnish instruction for raising chestnut, walnut, and locust trees from seeds. This is a subject of much importance to settlers in prairie countries; and even in many other parts of the country, it would be well if farmers would plant a few acres of their grounds with forest trees for the prospective wants of their children, if not for their own benefit. In some parts of the state there is already quite a scarcity of timber for fencing and building purposes, as well as for fuel, and good woodland is worth more per acre than that under cultivation.

The first thing demanded on the part of those intending to plant forest seeds, is to select such kinds of trees as are best adapted to their soil. Much labor has been wasted by neglecting this precaution; and all the instructions we have seen in books and papers in regard to this business, have been defective on this point. It has been stated, for instance, that chestnut can be raised with the greatest ease from seed; and many farmers have been induced to try the experiment, but have very generally failed because their soil was not of the right kind. A deep sandy and dry soil is requisite for the successful growth of the chestnut; and it is in vain to attempt to make it thrive on soils of an opposite character, as we know from repeated experiments. The black walnut and butternut thrive best in a deep, rich, clayey, and gravelly loam, or what is commonly known as deep limestone soils. The same kind of soil is best suited for the sugar maple, but this tree will flourish on a greater variety of soils, and requires less depth than the walnut.

The hickory will bear a strong clay soil better than most other trees except beech. Neither of these are well adapted to the rich mucky or sandy soils of the prairies. The oak, in some of its varieties, will flourish on most good soils, not too wet or mucky, but is of too slow growth for our fast people. The locust, on account of rapid growth, valuable timber, and adaptability to various soils, is perhaps the most useful of all—but, unfortunately, it is so liable to be destroyed by the borer, that it can not be relied on in many parts of our country.

Saving and Sowing Seed. — Chestnuts, walnuts, and similar kinds of tree seeds, should never be suffered to become perfectly dry before planting. If not convenient to plant them soon after their time of ripening, they should be put in a box of sand, and kept moist, (not wet,) and be allowed to freeze during winter, then planted early in the spring, covering them about two inches in depth. They may be planted where the trees are to remain, taking care to keep the plants clear of weeds and grass while young; or, they can be transplanted when two or three years old, taking them up carefully, without injuring the roots, and not exposing them to drying while out of the ground.

Locust seed may be kept dry for a year or two, without destroying its vitality, but it must in all cases be thoroughly scalded before sowing, or it will lie a whole year in the ground without vegetating. For a quart of seed, pour on four quarts of boiling water, and let stand for twelve or twenty-four hours, when most, if not all the seeds will be swollen to several times their former size. If a considerable portion are not swollen, they must be scalded again. Stir the seeds while in the water, so as to agitate them briskly, and while in motion pour off the water and swollen seeds, while the others being heavier will remain at the bottom of the vessel; then scald and let soak as before, and they will generally all swell. The seeds can then be sown where designed to remain, or in a nursery bed, and the trees transplanted when one year old.—*Ohio Cultivator.*

Uses of Knowledge.—The acquisition of knowledge has two great objects; namely, to obtain information for its own sake—that is, for the sake of the uses to which that information may be applied; and also, by the varied exercise of apprehension, memory, reasoning, judgment, and other powers of the intellect, to render those faculties available for the purposes, however great, in which, one time or other, a man's position in life may require their utmost service.

The effect of education upon the individual is easily understood. It makes him what he actually is, as respects the particular stores of knowledge he possesses, and the command of mind he can bring to bear on every crisis of his life. But the man in society does not stand insulated, either as respects his knowledge or his powers of exertion. Every man possessed of knowledge and of ability, natural or acquired, sheds around him gifts of incalculable value. He is a center or focus from which light is diffused on every side. A person who is himself uneducated, by living among those who are educated, obtains no small share of the advantages which they possess. He picks up fragments of their knowledge; but by far the greatest of his gains arises from the circumstance that, by the imitative power with which our species is so largely gifted, he catches the spirit of the acquired modes of thinking possessed by those around him; so that, although his knowledge may remain rude and disjointed, he begins to think like one who has received a liberal education. Thus, like charity, knowledge carries with it a double blessing — blessing him that offers, and him that receives.

Plants in Pots and Management of Cuttings.

It is remarked that the purchasers of plants rarely succeed in keeping them in any degree of health for many weeks after they come out of the nurseryman's hands: this holds good particularly with those who place them in the windows of dwelling-houses. Plants so situated labor under certain disadvantages; but it can not be denied, that in public houses, in the rooms of poor and even dirty cottages—where it might be supposed that the pores of the leaves must be inevitably closed by carbonaceous matter, or dust—many healthy and beautiful specimens are to be found, which, if we except actual cleanliness of the foliage, fairly rival and eclipse those of the greenhouse. We have in our eye at this moment the window of a small, low, and dark room, occupied by a shoemaker, but a most enthusiastic admirer of the geranium (*pelargonium*), wherein flowers of the finest description, produced upon well grown plants, are always to be seen. How are we to account for these things! how reconcile them with the almost inevitable failure of many persons, who expend pounds every year upon plants, which in spite of every attention dwindle and fade away!

Another fact is worthy of notice; it is this:—If we pass through the streets of a country town, we can scarcely fail to observe that some particular genus or species abounds and flourishes with luxuriance, while plants of more easy culture appear miserably unhealthy. Thus in the town of Abingdon, England, we saw, two years since, in almost every window, specimens of Fuchsia (*conica* nearly without exception if our memory be correct,) that could scarcely be found in the very best collections, and growing in pots of two and three inches in diameter at the rims; the soil was heaped up round the stem, so as to preclude watering at top; hence the water must have been supplied by absorption from the pans. We do not recollect that a healthy geranium was to be seen in any of the windows of that ancient town. We can assign no better reason for these anomalies, than what is found in the trite old Latin line—*Omnia non possumus omnes;* and therefore shall quit digression, and proceed at once to the direct object we proposed to ourselves when we took up our pen. * * * Half the failures of amateur cultivators may be ascribed to the texture of the soil, which being "put in loose, or left in holes, the plant never properly thrives, but languishes" to its death. Let any one turn out the ball of a plant which he purchases of a skillful nurseryman, by reversing the pots, and while he supports the earth with the fingers, tapping the rim gently against a board or other resisting solid material, and he will rarely fail to discover that the soil is in the condition described; that is, compactly and firmly pressed every where, around and among the roots, without holes, and with a certain quantity of chips of pots or other open matters to serve as drainage for superfluous water.

When persons attempt to repot a plant, they but too often press and work about the old ball, to clear off and loosen the soil, then, after putting into a larger pot some common garden mold, they place the disturbed roots upon it, fill the surrounding space with the same mold, shake or strike the pot, water the surface, and bring the plant into a sitting-room, or perhaps place it in the open air on some bed of earth. This is a supposed case, it is true, but if it do not exactly apply, certain it is that the nurseryman employs soils, which his experience teaches him will suit the constitution of his plants, and bring them to a showy saleable condition. The purchaser is unable to obtain a compost, or even a pure loam, or vegetable earth of a similar character, and thus an ungenial medium is applied unskillfully about the roots; while the foliage of the plant is exposed to every inequality of light, air, heat, and water, which belongs to a sitting-room. If garden mold be used, or if the pot be placed in a border, *worms* are liable to be introduced, or to find ingress to the roots, and then woe to the plant; for, to say nothing of the direct injury they may occasion, those sappers gradually undermine the roots, perforate the soil and make it a complete gallery by their

contortive evolutions. Thus they produce all the evil consequences which result from loose and incompact potting, and also defeat the attempts to furnish a proper supply of water; for the holes they bore are just so many channels through which the fluid passes, without moistening the body of the soil.

We wish to add a word on two material points in the treatment of cuttings. Whenever sand (clean writing, or silver sand, or pure siliceous earth, free from adhesive matters,) is employed, it will not be amiss to saturate it with water before it be put on the soil in the pot; it will then act as a *quicksand*, embracing and closing upon the cutting, and entirely excluding the air from the heel; so prepared, it is readily kept moist and free, whereas sand, if applied dry, receives water with great difficulty. In taking off and preparing a cutting, we have frequently found it better to cut, not *through the joint*, but a trifle below it; this will leave the part completely perfect. At every joint a bud or system of life exists, and this it is which in ordinary cases propels the first radical processes; by not injuring the vital point we act prudently, and on the same principles as when in "budding" a tree or shrub we carefully retain the *eye* of the bud, for without *that* there can be no success. The importance of buds or eyes is always kept in view by a practiced gardener; but it must not be overlooked that in every case where the peculiar state of the wood, as to age or ripeness, which the individual plant required, is equally at command, a *slip* will succeed better than an ordinary cutting, because it abounds with *embryos* of buds at its base, and these are most active in the production of those minute fibrous processes, which in the first instance establish the connection between the cellular alburnum of the infant plant, and its earthy medium of nutrition. We are indebted for the hint to a nurseryman of eminence, when conversing upon the means of propagating *gardenia;* the rule is not without exception, but it is of the first consequence, and should be always retained in the mind.—*Pax. Bot. Mag.*

A house in New Albany, Indiana, has shipped this season over two thousand barrels of dried fruit to the Philadelphia and New York markets.

The Absorbent Powers of Spongioles of Roots.

BY THOMAS ANDREW KNIGHT, ESQ., F. R. S.

An opinion is very extensively, if not generally, entertained, that the nutriment which trees and other plants derive from the soil in which they grow, is exclusively taken in by the cellular extremities of their roots, which, from their texture, have been called spongioles; and which, in their organization, differ from other parts of the root, in being totally without any alburnum or woody matter distinct from the bark. But it is through the alburnum alone of trees, as I have proved by a great variety of experiments, and as is, I believe, generally admitted, that the ascending sap, under ordinary circumstances, passes up from their roots into their branches and leaves; and as this substance does not exist in the spongiole, my attention was directed to an inquiry whether the spongioles possess the power of transmitting fluids, and, if such power were found to exist in them, through what peculiar channels such fluids pass up; and as these questions are necessarily interesting, and to some extent, in particular cases, may become important to the practical gardener, I communicate the result of my experiments.

Spongioles are obtainable in the most perfect state from large seeds, such as those of the common, or French bean, which have been permitted to germinate by simply detaching them from the cotyledons; as they thus remain united to the caudex of the plant, and its bud and plumule. Many of these were obtained from the seeds of plants of several kinds, and subjected to various modes of treatment in soils of different qualities; but all perished without a single plumule having expanded, or having apparently received any nutriment either from the soil or other source. Yet the spongioles, in these cases, must have contained greatly more living, organizable matter, derived from their cotyledons, than the whole body of the seed of a very large majority of plants can possibly contain; but they were, I conclude, incapable of transmitting it into the plumules, owing to the want of alburnum. I therefore believe my opinion, that spongioles are imperfectly organized parts of the plant, which neither absorb from the soil, nor transmit fluids of any kind for the service

of other parts of it, to be well founded; but alburnous matter is generated with great rapidity within them, and they become, to a very great extent, transmuted into perfect roots long before the growth of the stem or branches of the tree commences in the spring, and by these newly-formed roots (but not by these exclusively) I conceive that nutriment is absorbed from the soil and sent up into the leaves, to be there converted into the true sap of the plant. I am aware that the above stated opinions are in opposition to those of many eminent physiologists, to which much deference is due; but I think that they have erroneously included within their spongioles portions of alburnous fiber, a substance never found in the organ properly called a spongiole.—*Pax. Bot. Mag.*

The Plant we Rear.

BY J. F. W. JOHNSTON, F. R. S.

A perfect plant consists essentially of two parts—the stem and the leaf. The root is an underground extension of the stem, as the bark is a downward prolongation of the leaf. The several parts of the flower, also, are only changed leaves.

When any part of a plant is heated in a close vessel, it gives off water, vinegar, and tarry matters, and leaves behind a black, bulky, coaly mass, known by the name of wood charcoal; or if billets of wood be heaped up in the open air, covered carefully over with sods, and *smother*-burned, as it is called, with little access of air, the tar and other matters escape into the atmosphere, while the charcoal remains undissipated beneath the sod. This charcoal is an impure form of carbon. The manufacturer of wood-vinegar collects the volatile substances as the more important products. The charcoal-burner allows them to escape, the black residue being the object of his process. Both experiments, however, are the same in substance, and both prove that carbon and water form large parts of the weight of all plants.

If a piece of wood charcoal be burned in the air it gradually disappears; but when all combustion has ceased, there remains behind a small proportion of ash. The same is seen if a portion taken from any part of a living plant be burned in the air. Even a bit of straw kindled in the flame of a candle, and allowed to burn, will leave a sensible quantity of ash behind. All plants, therefore, and all parts of plants, besides water and carbon, contain also a sensible proportion of mineral inorganic matter which is incombustible, and which remains unconsumed when they are burned in the air.

The carbon of the plant is chiefly derived from the air, the water and the mineral matter chiefly from the soil in which it grows. Thus the plant we rear has close chemical relations with the air we breathe, with the water we drink, and with the soil we cultivate. I shall briefly illustrate these several relations in their order.

First. The plant is in contact with the air, through its leaves and its bark. The surface of the leaf is studded over with numerous minute pores or mouths (*stomata*), through which gases and watery vapor are continually entering or escaping, so long as the plant lives. In the daytime they give off oxygen and absorb carbonic acid gas. During the night this process is reversed—they then absorb oxygen and give off carbonic acid.

Carbonic acid consists of carbon and oxygen. It is from the large excess of this gas which plants absorb during the day, that the greater part of the carbon they contain is usually derived.

The number and activity of the little mouths which stud the leaf are very wonderful. On a single square inch of the leaf of the common lilac as many as 120,000 have been counted; and the rapidity with which they act is so great, that a thin current of air passing over the leaves of an actively-growing plant is almost immediately deprived by them of the carbonic acid it contains.

The gas thus absorbed enters into the circulation of the plant, and there undergoes a series of chemical changes which it is very difficult to follow. The result, however, we know to be, that its carbon is converted into starch, woody fiber, &c., to build up the plant, while its oxygen is given off to maintain the purity of the air.

These pores of the leaf absorb also other gaseous substances in smaller quantity—such as ammonia, when it happens to approach them; and especially they absorb watery vapor, when previous heat or drought has dried the plant, and made the leaves droop, soft and flaccid. Hence the natural rain enlivens and invigorates the herbage, and the artificial shower gives new life to the tenants of the conservatory. The falling water not only supplies their want of fluid, but it washes also the dusty surface of the leaves, and clears their many mouths, so that with fresh vigor they can suck in new nourishment from the surrounding air.

The green bark of the young twig is perforated with pores like the green leaf, and acts upon the air in a similar way; but as it hardens and gets old, the pores become obliterated, and it ceases to aid the leaves in absorbing carbonic acid, or in giving off oxygen to the atmosphere.

Second. The water which fills the vessels of the plant, though partly derived from the air in seasons of drought, and drunk in by the leaves from the dews and falling showers, is principally sucked up by the roots from the earth in which it grows. These roots, as I have said, are only downward expansions of the stem. At the surface of the ground they exhibit a bark without, and a pith within, the woody portion. But as they descend, these several parts disappear, and graduate into a porous, uniform, spongy mass, which forms the ends of the fibery rootlets. Upon the surface of these rootlets the microscope enables us to perceive numerous minute hairs, which, like hollow horns, thrust themselves laterally among the particles of the soil. Through these hollow hairs, as it is believed, the plant draws from the earth the supplies of water it constantly requires, and which in droughty weather it so copiously pours out from its leaves into the air.

How interesting it is to reflect on the minuteness of the organs by which the largest plants are fed and sustained. Microscopic apertures in the leaf suck in gaseous food from the air; the extremities of microscopic hairs suck a liquid food from the soil. We are accustomed to admire, with natural and just astonishment, how huge rocky reefs, hundreds of miles in length, can be built up by the conjoined labors of myriads of minute insects laboring together on the surface of a coral rock; but it is not less wonderful that, by the ceaseless working of similar microscopic agencies in leaf and root, the substance of vast forests should be built up, and made to grow before our eyes. It is more wonderful, in fact; for whereas in the one case dead matter extracted from the sea is transformed only into a dead rock, in the other the lifeless matters of the earth and air are converted by these minute plant-builders into living forms, lifting their heads aloft to the sky, waving with every wind that blows, and beautifying whole continents with the varying verdure of their ever-changing leaves.

The water which the roots absorb, after it has entered the plant, serves many important physiological and chemical purposes. It fills up mechanically and distends the numerous vessels; it mechanically dissolves, and carries with it, as it ascends and descends, the various substances which are contained in the sap; it moistens and gives flexibility to all the parts of the plant, and, by evaporation from the leaves, keeps it comparatively cool, even in the sunniest weather. But its chemical agencies, though less immediately sensible, are equally important. It combines with the carbon, which the leaf brings in from the air, and forms woody fiber, starch, and gum—all of which consist of carbon and water only; it serves as a constant and ready storehouse, also, for the supply of oxygen and hydrogen which are required, now here and now there, for the formation of the numero . different substances which, in smaller quantity than starch or woody fiber, are met with in the different parts of the plant. Thousands of chemical changes are every instant going on within the substance of a large and quickly-growing tree, and in nearly all these the constituent elements of water—its oxygen and hydrogen—play a constant part. The explanation of these, though yet very imperfectly studied, fills up already a large division of our modern treatises on organic chemistry.

Third. To the soil the plant is perceived, even by the least instructed, to have the closest relations. To the most instructed, these relations every day appear more interesting and wonderful.

I have already adverted to what may be called the physiological habits of plants, which incline them to grow upon soils which are more or less wet, more or less sandy and porous, and more or less heavy in the agricultural sense. Owing to these habits, every variety of soil, in every climate, supports its own vegetable tribes. Thus, of the five thousand flowering plants of central Europe, only three hundred grow on peaty soils, and these are chiefly rushes and sedges. In the native forests of northern Europe and America, the unlettered explorer hails the gleam of the broad-leafed trees glittering in the sun, amid the ocean of solemn pines, as a symptom of good land on which he may profitably settle. And so the rudest peasant at home knows that wheat and beans affect clay soils,—the humblest north German, that rye alone and the potato are suited to his blowing sands,—and the Chinese peasant, that warm sloping banks of light land are fittest for his tea-plant, and stiff, wet, impervious clays for his rice. Even the slave of Alabama is aware that dry open alluvials, and porous uplands, suit best the cotton he is taught to cultivate; and the still more degraded slave of Pernambuco, that the cocoa grows only on the sandy soils of the coast—just as in his native West Africa the oil-palms flourish on the moist sea-sands that skirt the shore, and the mangroves, where muddy shallows are daily deserted by the retiring tide.

But these relations of plants become more conspicuous when we examine somewhat closely the influence of artificial changes in the soil upon the kind, the growth, and the character or appearance of the plants which spring up or are sown upon it.

Thus, when a peaty soil is drained, the heaths disappear, and a soft woolly grass (*Holcus lanatus*) overspreads its surface. A wet clay is laid dry, and the rushes and water-loving plants are succeeded by sweet

and nutritious herbage. Lime is applied, and sorrel and sour grasses are banished from the old pasture; and corn then ripens and fills the ear, where formerly it languished and yielded scanty returns of unhealthy grain. Crushed bones are strewed over a meadow, and abundant milk and cheese show how the eatage of cattle has been improved—or they are drilled into the plowed land, and luxuriant root crops exhibit their ameliorating effect. Or guano, or the droppings of cattle, or the liquid of the farm-yard, or nitrate of soda, are spread upon the scanty pasture, and straightway the humble daisy and the worthless moss—symbols of poverty—disappear, and rejoicing crops of most fragrant hay prove the close connection of the plant with the soil on which it grows.

The plant derives, as I have elsewhere said, the whole of its mineral matter from the soil, and an important portion also of that which forms its cumbustible part. A naturally fertile soil contains all these things in sufficient abundance, and can readily supply them to the craving roots. The waters which moisten the soil dissolve them, and the minute hairs I have spoken of suck them up, and send them through the roots and stem to the several parts of the plant. The art of manuring merely supplies to the soil those necessary forms of vegetable food in which it is deficient; and the effects which follow from the addition of manures show how closely the welfare of the plant is connected with the chemical composition of the soil. The raw materials also, which it takes up by the root, like those which enter by the leaf, undergo within the plant numerous successive chemical changes, by which they are converted into the substance of the plant itself, and are fitted for those after purposes, in reference to animal life, which, in the economy of nature, the plant fulfills.

Among the pleasing proofs of such chemical changes taking place within the plant, I may mention the effects upon the color of their flowers, which follow from the application of certain substances to the roots of plants. Charcoal powder darkens and enriches the flowers of the dahlia, the rose, the petunia, &c.; carbonate of soda reddens ornamental hyacinths, and super-phosphate of soda alters in various ways the hue or bloom of other cultivated plants. As the dyer prepares the chemical ingredients of the baths into which his stuffs are to be dipped, and varies the one with the color he is to give to the other—so within the plant the substances applied to the root are chemically prepared and mixed, so as to produce the new color imparted by their means to the petals of the flower.

But such effects of chemical art are far inferior both in interest and importance to those which protracted nursing have produced upon our commonly cultivated plants. The large and juicy Altringham carrot is only the woody spindly root of the wild carrot (*Daucus carota*) luxuriously fed. Our cabbages, cauliflowers, Kohl-rabis, and turnips, in all their varieties, spring from one or more species of Brassica, which in their natural state have poor woody bitter stems and leaves, and useless spindle-shaped roots. Our cultivated potato, with all its varieties, springs from the tiny and bitter root of the wild potato, which has its native home on the sea-shore of Chili; and our apples, plums, grapes, and other prized fruits, from well-known wild and little-esteemed progenitors. Our gardens are full of such vegetable transformations.

It is so also with our corn plants. On the French and Italian shores of the Mediterranean grows a wild neglected grass, known by the name of Aegilops. Transplanted to the garden or to the field, and differently fed, its seed enlarges, and, after a few years' cultivation, changes into perfect and productive wheat. From other plants originally wild like this, though as yet unknown, have come our oats and barley, and rye and maize, in all their varieties, as well as the numerous forms of the Eastern durrha, rice and millet, and of the less known quinoa of Upper Chili and Peru. It is the new chemical conditions in which the plants are placed, which cause the more abundant introduction of certain forms of food into their circulation, and the more full development, in consequence, either of the whole plant, or of some of its more useful parts.

It is with unconscious reference to these improved conditions that certain wild and useless plants attach themselves to and appear affectionately to linger in the footsteps of man. They follow him in his migrations from place to place—advance with him, like the creeping and sow thistles, as he hews his way through primeval forests—reappear constantly on his manure-heaps—spring up, like the common dock, about his stables and barns—occupy, like the common plantain, the roadsides and ditches he makes—or linger, like the nettle, over the unseen ruins of his dwelling, to mark where his abode has formerly been. Thus, with the European settler, European weeds in hundreds have spread over all northern America, and are already recognized as familiar things, speaking to them of a far-off home, by the emigrants now landing in thousands on the shores of Australia and New Zealand. We can not say that all these have followed the European. Many of them have only accompanied him, and, like himself, taken root in what has proved a favorable soil. But those which cling closest to his footsteps, which go only where he goes—which, like his cat, or his dog, are, in a sense, domesticated—these attend upon him, because near his dwelling the appropriate chemical food is

found, which best ministers to the wants of their growing parts.

How singularly dependent the plant is upon the chemical nature of the medium in which it is placed, is beautifully illustrated by the manner in which the humblest forms of vegetation are seen to grow and propagate. The yeast with which we raise our bread is a minute plant belonging to the division of the Confervæ. If we make a thick syrup of cane-sugar, and strew a few particles of this yeast upon it, they will begin to grow and propagate, will cause minute bubbles of gas to rise, and the whole syrup gradually to ferment. But if, instead of a syrup of sugar, we take a thick solution of gum, the yeast will produce no sensible effect; it will neither propagate nor cause a fermentation. In the one case the minute plant has met with a somewhat congenial food; in the other it has found nothing on which it can live and grow.

But in the juice of ripe grapes it has a more favorable medium still. "If we filter this juice we obtain a clear transparent liquid. Within half an hour this liquid begins to grow first cloudy, and afterward thick, to give off bubbles of gas, or to ferment, and in three hours a grayish-yellow layer of yeast has already collected on its surface. In the heat of the fermentation the plants are produced by millions—a single cubic inch of such yeast, free from adhering water, containing eleven hundred and fifty-two millions of the minute organisms." The cells or globules vary in size from [illegible] to [illegible] of an English inch.

The juice of the grape thus readily propagates the seeds of yeast which accidentally reach, or are naturally present in it, because it contains the food which, in kind, in form, and in quantity, is best suited to its rapid growth.*

And so it is with larger plants in the soil. They grow well and healthily, if it contain the food in which they delight. They droop if such food is absent, and again burst into joyful life when we supply by art those necessary ingredients in which the soil is deficient.

But the special chemical changes that go on within the plant, could we follow them, would appear not less wonderful than the rapid production of entire microscopic vegetables from the raw food contained in the juice of the grape. It is as yet altogether incomprehensible, even to the most refined physiological chemistry, how, from the same food taken in from the air, and from generally similar food drawn up from the soil, different plants, and different parts of plants, should be able to extract or produce substances so very different from each other in composition and in all their properties. From the seed-vessels of one (the poppy), we collect a juice which dries up into our commercial opium; from the bark of another (cinchona) we extract the quinine with which we assuage the raging fever; from the leaves of others, like those of hemlock and tobacco, we distill deadly poisons, often of rare value for their medicinal uses. The flowers and leaves and seeds of some yield volatile oils, which we delight in for their odors and their aromatic qualities; the seeds of others give fixed oils, which are prized for the table or for use in the arts. The wood of some is rich in valuable dyes, while from that of others exude turpentines and resins of varied degrees of worth—from the cheap rosin of the tinsmith and soapmaker to the costlier myrrh and aloes and benzoin, which millions still burn, as acceptable incense, before the altars of their gods.

These, and a thousand other similar facts, tell us how wonderfully varied are the changes which the same original forms of matter undergo in the interior of living plants. Indeed, whether we regard the vegetable as a whole, or examine its minutest parts, we find equal evidence of the same diversity of changes, and of the same production, in comparatively minute quantities, of very different, yet often very characteristic forms of matter.

Thus, looking at a large tree as a whole, we are charmed with the brilliant green foliage which invests it when summer has come, and to which the landscape owes half its charms. Yet chemistry tells us that all this

* Whence comes the seeds of this yeast plant, which propagates itself with such wonderful rapidity? Do they exist already in the juice of the living grape? Do they cling to the exterior of the fruit, and only become mixed with the juice when it is in the wine-press, or do they float perpetually in the air, ready to germinate and multiply wherever they obtain a favorable opportunity? Whichever way they come, it would be too slow a process to wait for the natural appearance of these plants in the worts of the brewer and distiller. In these manufactories, therefore, it is customary to add a little yeast to the liquor as soon as it is considered ready for the fermentation. Then, as in the case of the grape, the growth and propagation of the plant proceed with astonishing rapidity, and large quantities of yeast are produced. This yeast in many distilleries forms an important by-product of the manufactory, and is collected and sold under the name of dry yeast, for the use of the private brewer and the baker. When this is done, the process adopted is nearly as follows: Crushed rye is mashed with the proper quantity of barley malt, and the wort, when made, cooled to the proper temperature. For every hundred pounds of the crushed grain, there are now added half a pound of carbonate of soda, and six ounces of oil of vitriol (sulphuric acid) diluted with much water, and the wort is then brought into fermentation by the addition of yeast. From the strongly-fermenting liquid the yeast is skimmed off, and strained through a hair sieve into cold water, through which it is allowed to settle. It is afterward washed with one or two waters, and finally pressed in cloth bags till it has the consistence of dough. It has a pleasant fruity smell, and in a cool place may be kept for two or three weeks. It then passes into a putrefying decomposition, acquires the odor of decaying cheese, and, like decaying cheese, has now the property of changing sugar into *lactic acid*, instead of into alcohol, as before. A hundred pounds of crushed grain will yield six to eight pounds of the crushed yeast. It is made largely at Rotterdam, and is imported thence to England, through Hull.

effect of color is produced by the fraction of an ounce of coloring matter distributed evenly over its thousands of leaves! Or taking up the leaf of a nettle, and picking off one of its minute stinging prickles, chemistry, by the aid of the microscope, assures us that the pain it causes, when allowed to pierce the skin, arises from a reservoir of a peculiar acid (the formic acid), which, like the poison of the serpent's tooth, is squeezed into the wound which the spikelet makes.

The characteristic property of the minute nettle-hair, and the peculiar charm of the wide landscape, are equally dependent upon the production in living plants of special forms of matter in comparatively minute proportions.

The tuber of the potato, the ripening apple, and the growing twig, present us with another illustration of special chemical changes proceeding continuously in the plant, and with a definite reference to a specific and useful end. The unripe potato, when taken from the earth, withers and shrivels, becomes unsightly to the eye, and vapid to the taste; the unripe apple shrinks in, refuses to retain its natural dimensions, and can not be kept for any length of time; while the unripe twig perishes amidst the chills of winter, and remains black and dead when the green buds of spring were expected to enliven its surface. These effects are the consequence of the thin bark which covers potato, apple, and twig alike, not having attained its matured composition. While unripe, this coating is porous and pervious to water, so that, when removed from the parent plant, tuber, fruit, and twig all give off water by evaporation to the air, and thus shrivel and shrink in as I have described. But when ripe, this porous covering has become chemically changed into a thin impervious coating of *cork*, through which water can scarcely pass, and by which, therefore, it is confined within for months together. It is this cork-layer which enables the potato to keep the winter through, the winter pear and winter apple to be brought to table in spring of their full natural dimensions, and the ripened twig to retain its sap undried, and to feed the young bud when the April sun first wakens it from its winter's sleep.

Nor are the general purposes for which the entire plant lives, and is the theater, so to speak, of so many changes, to be properly, I may say at all, appreciated without the assistance of chemical research.

It is true that every one can recognise in the natural herbage and the wild forest the ornaments of the landscape; in the thousand odors they distill, and in the varied hues and forms with which they sprinkle the surface, the most agreeable and refined ministers to our sensual pleasures. And in these things we unquestionably see some of the true purposes served by vegetation in the economy of nature. But they are subsidiary purposes—which they serve, by the way, as it were, while laboring to fulfill their true and greater vocation.

This vocation may be viewed in two aspects—*first*, as regards dead nature; and, *second*, as regards living things.

First. In its relations to dead nature, the plant serves, while living, to purify the air we breathe. It continually absorbs carbonic acid and gives off oxygen gas, and thus is a chief instrument in maintaining the normal condition of the atmosphere. It renders the air more fit for the support of animal life, both by removing that which is noxious (the carbonic acid), and by pouring into it that which is salutary (the oxygen) to animal health and life. And then, when it dies, it either covers the earth with a vegetable mold, which favors the growth of new generations of plants, or it accumulates into beds of peat or mineral coal, by which man is long after to be warmed, and the arts of life promoted. But in either case it only lingers for a while in these less sightly mineral forms. It gradually assumes again the gaseous state, and whether it is allowed naturally to decay, or is burned in the fire, ultimately arises again into the air in the form of carbonic acid. By this means, in part, vegetation is perpetuated upon the globe, and the natural composition of the atmosphere, as regards the proportion of the carbonic acid gas, is permanently maintained. And,

Second. As regards living animals, we all know and feel that plants are necessary to our daily life. Utterly dry up and banish vegetation from a region, and nearly every sensible form of animal life forthwith disappears. But how do plants feed us? And by what virtues in their several parts can the ox thrive on the straw, while man can live only on the grain? How on the nut and fruit of the tree only can human life be permanently sustained, while the leaves and twigs of the thick forest sustain the lordly elephant?

As to dead nature, the plant serves a subsidiary purpose in covering and adorning it—so to living nature, to man especially, it serves a similar subsidiary purpose in producing the numerous remarkable products, to which I have already alluded as being useful in medicine and the arts, and as ministering to the luxuries and comfort of civilized life. In the production of these we recognize a destined and benevolent purpose served by the general vegetation of the globe, in reference to living things. But this purpose is only secondary, and, as it were, ornamental. The main object of the plant, in its relations to the animal, is to feed it. This it does with various forms of

vegetable matter in different climes and countries, and it provides for each herbivorous and carnivorous race those peculiar forms on which it best loves, because best fitted, to feed. It is so with man. His vegetable food varies with the part of the world in which he is situated; yet upon all the varieties with which different climates furnish him, he discovers the means continuously to sustain himself.

Of what chemical substances do these different forms of nutritious food consist? What do they possess in common? In what do they differ? Why do some of them, weight for weight, sustain the body more completely or for a longer time than others? Why do they affect the dispositions of those who consume them—not only the constitution of individuals, but the habits, temperament, and character of whole nations? Why do we choose to mix the forms of vegetable food we consume—whence come the fashions of universal cookery—whence the peculiarities of national dishes?

What a host of curious chemical inquiries spring up in connection with the plant we rear, regarded as the main sustenance or staff of common life?—*Chem. of Common Life.*

Flowering of our Native Plants.—No. III.

FLOWERS OPENING IN MAY.

Actæa alba—White Baneberry.

Anemone Virginiana—Tall Anemone.

Aphyllon uniflorum—One-flowered cancer-root.

Arabis dentata—Toothed cress.

Arum triphyllum—Indian Turnip.

Catalpa Bignonioides—Catalpa.

Cerasus cerotina—Wild Cherry.

Cornus sericea—Silky Dogwood.

" paniculata—panicled Dogwood.

Corallorhiza innata—Early Coral-root.

Cynthia Virginica—Cynthia.

Cypripedium pubescens—Yellow lady's-slipper.

Cypripedium spectabile—Handsome lady's slipper.

Fragaria Virginiana—Wild Strawberry.

Gymnocladis canadensis—Coffee-tree.

Heuchera Americana—Alum-root.

Hydrophyllum appendiculatum — Hairy Water-leaf.

Hydrophyllum Canadense—Canadian Water-leaf.

Hydrophyllum macrophyllum—Great Water-leaf.

Hydrophyllum Virginicum — Virginian Water-leaf.

Hypoxis erecta—Star-grass.

Impatiens pallida—Pale Touch-me-not.

Iodanthus hesperidoides—Wild Rocket.

Iris versicolor—Blue Flag.

Juglans nigra—Black Walnut.

Lathyrus venosus—Veiny Vetchling.

Liriodendron tulipifera—Tulip Tree.

Menispermum canadensis — Canadian Moonseed.

Mitchella repens—Partridge Berry.

Morus rubra—Red Mulberry.

Nuphar advena—Yellow Pond Lily.

Nyssa multiflora—Black Gum.

Orchis spectabilis—Elegant Orchis.

Oxalis stricta—Yellow Wood Sorrel.

" violacea—Violet do.

Pedicularis canadensis—Common Lousewort.

Phacelia bipinnatifida.

Phlox glaberrima—Smooth Phlox.

" maculata—Spotted Phlox.

" paniculata—Panicled Phlox.

Podophyllum peltatum—May Apple.

Polygonatum canaliculatum — Solomon's Seal.

Rubus villosus—Blackberry.

" canadensis—Dewberry.

Rumex acetosella—Sheep Sorrel.

Sedum ternatum—Stone-crop.

Smilacina racemosa—False Spikenard.

Synandra grandiflora — Large-flowered Synandra.

Valeriana pauciflora—Few-flowered Valerian. L.

Cincinnati, April, 1854.

(To be continued.)

Illinois Apples.—At the close of the Illinois State Fair, last October, a barrel of apples was selected from those exhibited, put up in papers, with their names, and sent by express to the American Institute, whose annual exhibition was to come off immediately in the city of New York. They reached their destination safely, and elicited many expressions of admiration. The specimens were larger than apples of the same varieties grown in New York, and were generally more perfect and beautiful. Good judges state that Illinois apples were twenty per cent. superior to the same varieties of eastern fruit. We are pleased to learn, in addition, that a gentleman has taken casts of these apples, which are colored so as to furnish exact representations of them; and these are now on exhibition at the Smithsonian Institute, Washington City.—*Springfield Journal.*

The Chemistry of Organic Cells.

BY J. L. RIDDELL, M. D.
Prof. Chemistry in Med. Dep. Univer. La.

General Form and Structure of Organic Cells.—The simplest as well as the minutest forms invested with life, within our cognizance, are exceedingly minute microscopic cells. Hollow spheroid, rounded bag, or saccule, are expressions which more plainly and more definitely convey the meaning intended by the word cell. These saccules, which in general may be likened to a bladder without the neck, are, when living, filled with liquid and organized contents; the latter being sometimes, but not always, attached internally to the cell membrane, and consisting commonly of smaller saccules or vesicles, of a structure on a smaller scale, apparently similar to the containing cell. I am satisfied from unnumbered careful observations directed to that point, that living cells are never seen to be truly simple; but always to contain within them more or less organized vesicular structure. The cell which has ceased to be vitally active, like the rind of an orange, the shell of an egg, or like an empty bottle, may perhaps be entirely devoid of organized contents. But the true essential structure of living cells is no more to be learned from such, than the anatomy of the bowels from an eviscerated mummy.

Arrangement of Cell Contents.—The organized cell contents, whether consisting of irresolvable points, granules, vesicles, nucleoli or nucli, are observed in different cells, and at different times in the same cell, to present the following diversities of arrangement:

1. Aggregated together into an adherent granular or vesicular mass, and having an attachment, most commonly parietal, to the containing cell membrane.

2. Aggregated, mutually adherent, but free, having no attachment to the cell membrane.

3. Separate and free; the individual granules or nucleoli floating independently in the fluid contained in the cell.

In the progress of the performance of their different vital functions, the inducellular contents are seen to pass from one of these conditions to another. The vital force pertaining to the vesicles appears to be more exalted in the segregated or independent, and less in the aggregated or attached condition.

The foregoing statements respecting vesicles, etc., as the contents of cells, are mostly applicable to the cells themselves. They are sometimes aggregated and adherent, forming tissues; sometimes separated and free, as exemplified by blood corpuscles; and to the free cells, as blood, spermatozoa, etc., the most active and exalted condition of vitality pertains. In the aggregated state, they are frequently seen to have lost their rounded form; and by mutual pressure, to have become polyhedral.

Habitat.—If you ask me to point you out actual organic cells, by way of illustration, I say to you, bring into the field of a good microscope any portion of the vast diversity of organized and living substances abroad in nature, from the rank slime of the sickly marsh to the warm blood which courses in your own veins, and at every trial you will behold the cells of which I am speaking. In nearly all natural waters upon the face of the earth, minute forms of life abound, which in all respects observable, can be likened to mere cells, floating free and independent in their native element. With them, other cells, joined end to end, forming moniliform or jointed filaments, do also abound, as do likewise others, associated together in a manner more complicated. The air we breathe is charged with cells of wonderful minuteness, the germs of alleged fortuitous growths, the spores of cryptogamic vegetation, and the prolific source of pestilential maladies. The mold that delights in damp and darkness, the harbinger of dissolution and decay, may be seen to consist of extremely delicate cells, planted one upon another. The whole tissue of the *Fungi*, or mushrooms, is made up of organic cells, somewhat as walls are made up of bricks. Cells constitute the principal structure in all parts of all plants. In the living state they are most conveniently observable in the leaves, flowers, fruit and cambium. Cells also constitute the principal structure in the early embryonic condition of animals; and in all stages they can be observed in most of the animal tissues; best perhaps in the mucous, epidermic, glandular and cartilaginous structures.

Size.—In general, organic cells are individually truly microscopic objects, being by far too minute for unassisted vision. Larger cells are seen in animal than in vegetable tissues. In every species of organism, however, cells or utricles do abundantly occur, of a minuteness of size beyond the power of our microscopes clearly to define. They are seen satisfactorily to be as small as 1-100,000 of an inch in diameter; and on the other hand, in vegetable structure, as large as 1-30 of an inch,* the average of vegetable cells being near 1-500 of an inch in diameter.

Human blood corpuscles, which are vital cells, are less in diameter than 1-3000 of an inch. Animal ova are perfectly well characterised cells, and they afford us, as in the eggs of birds, perhaps the largest known samples of that structure.

Chemical Composition, in connection with Structure.—In respect to the chemical composition of living cells, it may be safely said that it is complex; oxygen, hydrogen, carbon

*Gray's Bot. Text-Book, p. 26.

and nitrogen, being always present, and in such high proportions as to be not expressible with certainty by chemical formulæ. Phosphorus, sulphur, iron, manganese, calcium, sodium, magnesium, etc., in essential proportions, are, in different classes of cells, often met with. I think that protoplasmic, or vitally active cells, consist mainly of those complex nitrogenous substances denominated protein compounds. The number of the proteine and proteinoid nitrogenous substances thus naturally occurring, must be very great, although very few have as yet been chemically defined.

The primordial living cell, or vital cell lining, sometimes called the protoplasm, whether examined in animal or vegetable tissues, manifests in all respects nearly the same essential characteristics; possessing, indeed, all the wonderful prerogatives of animal life. This primordial living cell usually becomes invested, at an early stage, with a membranous covering, of a different nature and composition in different instances; a structure which, like the walls of the contained living cell, is permeable to liquid; permitting of the occurrence of the physical phenomena of endosmose and exosmose; but which, by itself, does not seem to possess vitality. This secondary non-vital cell, most frequently endures, long after its vital contents have become inert, suffered change or dissolution, or perhaps entirely disappeared by absorption. Now the chemical composition of the non-vital, comparatively permanent cells, is exceedingly various, and often comparatively simple. Of such nature is cellulose and starch; the characteristic components of most vegetable tissues. Of such nature are many epidermic, epithelial and cartilaginous cells in the animal structure.

Functions of Cells.—The functions performed by organic cells may be regarded as threefold—purely physical, chemical and vital. Their most important physical function depends upon their permeability to liquids. No sensible pores exist in the cell membrane; yet a ready transit is afforded to water and watery solutions, in accordance with the laws of endosmosis. Whatever thus traverses a cell membrane, must apparently be in a complete state of solution, and devoid of all organization. The blastema, in what condition soever it may be presented at the exterior surface of the cell, must become (if not already in that condition) apparently deorganized and perfectly fluid.* The chemical changes and transformation attendant upon cell life, are numerous, varied, complex, and highly important. Besides the principal ultimate elements, which I have already named as contributing to the composition of cells, many others of the so-called inorganic elements take part in their chemical operations. In fact, an organic cell may be appropriately regarded as a skillfully constructed and most efficient chemical apparatus; in which, not merely the ordinary forces of brute matter manifest themselves, but other more exalted forces, flowing apparently from vitality, and unknown in inorganic chemistry, are brought efficiently into play, causing the union of elements in an extraordinary, and frequently complex manner, giving rise to the so-called organic compounds, which are beyond the reach of human art to imitate. These organic compounds are sometimes found as a part of the cell contents, sometimes intercellularly or between the cells, and sometimes penetrating and even replacing the cell wall. In such apparatus, and by such means, all the material transformations of organic life, so wonderful to contemplate, are said be effected.

The vital functions of cells most important to be mentioned at this time, pertain to their development, growth and decay. The vitally active adult cells of an organism are, for many reasons, presumed to be very short lived—a few days or weeks at most, unless prolonged by dormancy; the vital functions of an animal or plant being performed successively by adequate recruits of newly developed cells, the progeny of the former. The old and useless protoplasmic cell membrane suffers disintegration, dissolution and removal; its available material is contributed for the nutrition of its successors, and its effete matter returned to the earth and atmosphere, whence it was originally derived—there to be broken up into its primordial elements,—to be purified indeed by complete decay. * * * * Considering the specific difference, the vast diversity, and the wonderful functions of cells, I feel impelled to acknowledge the influence of what we call vitality, as something more refined and exalted than what we mean by chemical force; and so far from perceiving similarity or analogy between the two, it appears to me that there are scarcely points of even remote resemblance.—*N. O. Med. and Surg. Jour.*

* We can not, in the present state of our knowledge, positively affirm or deny, that invisible organized particles find transit through organic membranes. For aught we know, the intermolecular spaces occurring in the ultimate structure of the walls of cells and vesicles, may be proportionate in width somewhat, to the size of the cell or vesicle, or to its stage of development, from the minutest transcendental germ to the adult cell. If so, we might expect to find in the more minute corpuscles a more intense vital force, and a greater power of resisting chemical agents; precisely what we observe in the action of vinegar, alkalies, etc., on blood. The intensity of the endosmotic power would be found to vary inversely, while the facility of endosmotic transmission would vary directly as the size of the corpuscle. Admitting the hypothesis, which is not improbable, it would then be possible to understand how exceedingly minute organic germs could find transit through an organic membrane, floating through the intermolecular spaces, in an endosmotic liquid current. I am inclined to believe such does occur; for I have often seen diseased animal cells, seemingly entire, yet containing indocellular growths, apparently abnormal or parasitic. Malarious organized poisons may thus penetrate, and by their parasitic development, vitiate the corpuscles of human blood.

Correspondence.

THE FOX GRAPE.—A SECOND SOLOMON.

EDITORS HORTICULTURAL REVIEW—

I met with a proof-sheet of a work now publishing, on American grapes. The Catawba is included in the fox family. Speaking of our Catawba grape, the writer says, that "its fruit is so watery, like all the grapes of America, that it is thought necessary to add sugar to the must before fermentation, not considering that the must, before fermentation, can be made of any strength with regard to the sugar contained in it, by boiling, as is done in some parts of the country, with apple and pear juice." In these back woods, we are so ignorant, that we hold a different doctrine; we say that the Catawba, and some other of our native grapes, contain more sugar than the wine grapes of France and Germany; and that the fermented wine contains more strength. I weighed must of native grapes last fall, that by the German scale weighed from 90 to 115 degrees. Mr. Buchannan's vineyard of Catawba grapes produced 850 gallons to the acre, and his must did not weigh as much as the must of the Catawba grapes in some vineyards on the river, by several degrees. Yet his wine now weighs from seven to nine degrees. The wines of France and Germany are considered good, where they average two thirds of this weight. Common sense should have taught the writer that where a must is deficient in sugar, that the best of pulverized loaf sugar is far preferable to boiling the must. In Europe, where sugar is dear, and must cheap, they boil it. He speaks in high terms of the white fox grape of the East, and as superior to the Catawba. It is less juicy, skin thick, pulp hard; does not contain two thirds as much sugar; not one fifth as many grapes on the bunch that generally drop from the bunch as the fruit ripens; and its only value, except in an extreme north latitude, is its value for musket balls.

The Catawba must for wine, when the grapes are ripe, is injured by adding sugar, unless a sweet wine is wanted for sweet ladies or gentlemen, not accustomed to drink the Hock wines of Europe. The addition of spirits injures its aroma and flavor. No pure wine will bear transportation in casks, in warm weather, a long distance. In a hot climate, like Madeira, where grapes ripen in warm weather, brandy is always added, to preserve the wine. N. LONGWORTH.

Cincinnati, April 15, 1854.

The Antirrhinum.

A great number of florists' flowers, though exceedingly beautiful, have the disadvantage of their bloom being short-lived. Such, for instance, as the glorious, though somewhat gaudy, tulip, and the neat-blossomed ranunculus. These, and some others, which the florist will easily recollect, only last, with every attention to shading them from the flower-fading power of the sun, some five or six weeks; but I may fairly claim for the antirrhinum the power, with very moderate care, of continuing to reward the cultivator with its bright-colored blossoms for at least three months, and that at a season when florists' flowers are comparatively scarce. Even as a bedding-out flower it has great merit. It produces at least three colors not to be surpassed by any flower—I mean bright crimson, pure white, and clear yellow. For large beds, especially, it is well adapted, blooming continuously during July, August, and September.

The antirrhinum is so perfectly hardy that the seed may be sown in the open border of the garden. I would advise the zealous raiser of improved varieties, first to procure from some respectable florist a few of the leading best sorts now in cultivation, grow them one year, and save seeds from them, keeping the seed of each variety to itself. By adopting this plan he would find out the best breeders.

The time for *sowing* this carefully-saved seed is about the third week in April. Prepare a bed for it in an open part of the garden, by manuring it well in the autumn, and digging in the manure at the same time, leaving the surface rather rough for the frosts to act upon it and pulverize. Then, when the sowing time arrives, fork the surface over, breaking it as fine as possible. Choose a time when the surface is moderately dry for this operation.

When the seedlings have attained an inch or two in hight, dig another larger bed, and transplant the seedlings into it, planting them five inches apart every way, keeping the sorts still separate. Here they may remain till they flower.

There are many varieties of this plant, some of the most beautiful of which are but little known. The monochromes are the most desirable, as the pure white, the saffron, and the splendid crimson. The flower is sometimes double, and one variety is quite fragrant.

Plant Trees.

It is cheering to find that the editorial fraternity and others are directing public attention to the importance of providing for the present and future wants of great portions of our country, by recommending the systematic protection and cultivation of timber. Our good friend Kennicott, the horticultural editor of the *Prairie Farmer*, in his usual racy style, holds forth as follows:—

What would this earth be without TREES? It is nowhere entirely desolate except where they are not—and how beautiful are its ruggedness of hills, and monotony of plains, when occasionally fringed or tufted with even the poorest trees, of man's, or nature's planting.

And, regarding usefulness alone, it were almost better to dispense with iron than with wood; even though iron be at the bottom of civilization and progress. Trees are the every-day robes of earth, as its Creator dressed it—its natural defense against scorching sun, and blighting winds, freezing cold, and the wash and wear of falling waters.

CLIMATE is more influenced by trees, than those who destroy, or even those who plant them, are apt to imagine. We have no certain data at hand on which to base an estimate of the meliorating influence of trees. But, from some home-made calculations, based on observation, it is deemed nearly certain, that well grown hedges, (separating into twenty acre lots the naked prairies of northern Illinois, and those of Iowa and Wisconsin adjacent) with an average of one-sixth of the surface covered with orchard and timber plantations, would modify climate, equal to at least two degrees of south latitude, over most of this very bleak region of country.

The local protection afforded by trees is a matter pretty well understood, and yet too little practiced upon in the West. A plantation of from five to ten acres, surrounding the farm buildings, except toward the south, will make a saving of from ten to fifteen per cent. in fuel and fodder, at the very lowest estimate. And it has been said, and is fully believed, that by lining the belt of deciduous trees with our hardy evergreen species, very nearly double the difference can be made.

But it is more in reference to the coming wants of our prairie country in relation to structures, and especially the relaying of railroad tracks, (admitting that our coal fields can furnish fuel) that we would speak of the cultivation of trees—beyond the orchard and lawn. Our whole country is to be covered with a net-work of railroads; and locomotives will soon be as plentiful as were stage horses, before their advent. And your iron-horse is a huge feeder, and will rapidly devour the natural growth of the forest soil, while that can be had, even at a cost that would prevent its free use in the farm-house and city-dwelling. And after building new, and relaying old railroad tracks for the next twenty years, how much of the original timber growth will remain, over three fourths of the present States of the North West?

Now, it will take well nigh half a century to replace the timber already destroyed, or used up on our farms. Fire-wood can be grown in fifteen, and railroad ties in twenty-five years; and it is time that reading and thinking farmers set about it. With a little care and attention we can *preserve* immense quantities of the natural growth, which, in from ten to twenty years, will sell for many times the present value of the soil, and for three or four times the net product of any ordinary farm-crop which might be taken therefrom. And this timber will grow without culture, and beautify our homes, and protect them, while it is growing.

PLANT trees, too, good friends; there is no other crop that will pay so well in the end, and that end is not so far off as you fancy.

But what trees shall we plant? Plant the cottonwood, rather than not plant at all; or other hardy poplars, and even willows, on land fit for little else. We have seen these trees, grown from cuttings, large enough to make steamboat or railroad wood, or excellent charcoal, in ten years, with moderate cultivation.

There are, however, plenty of better trees. In the center and southern part of Illinois, the catalpa will make a good timber tree. Hereaway, the Scotch and American larch promise better than most others; the former on dry and rather poor soil, the latter on moist lands, whether rich or poor. In twenty-five or thirty years you will have "tall timber," and plenty of it, from either species.

Plant the locust, with especial reference to railroads and other structural purposes. The borer—its great enemy in the East—has not, so far as known, been found troublesome in the West. On dry semi-"barrens," and prairie swells, it is probable that the chestnut will succeed to admiration, and certainly the butternut and black walnut will thrive apace, both north and south of Chicago, on any good, deep soil.

And it is certainly advisable to plant evergreen-trees, too, with reference to timber purposes, as well as ornament and protection. For this purpose, perhaps the Scotch, Austrian, and American pines will be found most desirable at the north: when once established they are reasonably rapid growers, especially the first named.—*The Prairie Farmer*.

California Plants.

WILD CURRANT. RIBES GLUTINOSUM.

THIS interesting shrub abounds in the vicinity of San Francisco, where it attains to the hight of six or eight feet. The old bark of the young branches peels off like the Snow-Ball, Nine-Bark bush, or the Sycamore tree.

The leaves are heart-shaped, and like the geranium, three to five-lobed, doubly toothed,—with a sticky moisture from the little glands or dots on the tips of the hairs covering all parts of the foliage,—wrinkled, veiny, leaf-stem, —stipulate, —widened at the base, thin and membranous with eye-lashes on its edges. The racemes, or flower stems, spring from the same buds as the leaves, but are much longer, often bent back or plume-like, nodding, and twenty to fifty-flowered. In *dry* localities, the flowers set close against the stem; in *damp*, the flower stemlets are as long as the flower: the bracts, or colored leaflets mixed with the flower, are lance-shaped and red, like the tubular calyx or flower-cup, —this being bell-shaped, or often narrowed at the throat; five-parted, oblong and pointed, much longer than the inner—spatulate—red or whitish petals or proper flower leaves; five stamens or threads to one central pistil, two-parted at the top.

The fruit is oblong, ovoid and dark purple, when ripe—seeds large and numerous, the envelope pulpy, sweet and astringent, with glandular viscid hairs.

The charming beauty of this trim little shrub, with its numerous red and white blossoms nodding like a graceful plume to the gentle breeze, and clothed in foliage like our geraniums, must be seen in favorable damp localities, in order to be duly appreciated.

We are pleased to see this transplated as one of the many native ornaments for the rural cottage. It surprised me a little to find the fruit *pulpy* and not unpleasantly flavored, differing, in this respect, from the usual descriptions; compared, however, with our domestic currant, it is *useless*, and will surely prove a disappointment to those who have recently taken it up the country for table purposes.

To the anxious, toil-worn citizen, a frequent visit to the country would afford a rational pastime, where, freed from the ceaseless bustle through the mire of mud and money, he might admire the natural beauties of our sandy hills and little cozy valleys. On Saturday last, during a pleasant walk, while stopping to pencil a note under the branches of this shrub, the Humming Birds came flitting from flower to flower, sipping their nectar—thus beautifully illustrating the genial nature of our winter season. These objects often excite in me a thrill of happiness, and awaken the purer sentiments and warmer affections of early years—thus tending to improve the heart as well as health, and elevate the soul to the *Great Author* of the beauties of the world around us. A. KELLOGG, M. D.

San Francisco, Cal.

The Persian Cyclamen.

THE rapid decline of the season at this period forcibly reminds plantsmen, that although the mind has been almost satiated, at times, with rich colors through the summer months, both in-doors and out, yet that a dormant season awaits them, when every little addition to the stock of winter flowering plants will be hailed with delight.

Our readers are aware that most good gardeners cultivate a distinct section of winter-flowering things, and that such require special treatment; and among these, our present subject, the *Cyclamen Persicum*, introduced, according to "our Dictionary," from Cyprus, in 1731.

Most of our friends are acquainted with this charming flower, but, for all this, I will venture to affirm, that not one in a score of them have the most remote idea of the beauty this plant can be made to attain under the very highest order of culture.

To point to its merits were almost superfluous—its neat and dressy habit; the singularity and special character of its foliage; its long period of blooming, and that too, in the dull season; together with its delicious fragrance; all conspire to ensure it a welcome where highly cultivated. As to its fragrance and style of blossom, these will ever secure it a place in the neat bouquet; and I wonder much that it is not much more extensively cultivated for the supply of our markets.

I think it was the late Mr. Wilmot who first discovered, about twenty-four years since, that its previous culture had been very

imperfectly understood; that it had been regarded too much in the light of an ordinary bulb; and that it by no means required so decided a rest as most of that portion of the vegetable world. In those days they might be seen in April or May, almost devoured by aphides, potted away out of sight on some neglected shelf, the foliage perishing prematurely through sheer neglect. This plant is peculiarly liable to the attacks of the aphis, or plant louse, and fumigation should occasionally be restored to, especially while the new foliage is starting, and before the blossoms expand.

The Persian Cyclamen is readily produced from seed; but it must be borne in mind, that although the seed is saved from highly-scented kinds, not all the produce will be equally fragrant.

To begin at the beginning, I must beg to detail the practice of raising and nurturing seedlings. The seed of the Cyclamen is a most curious production; immediately on the heels of flowering, the seed-stalk withdraws itself from public gaze, and lies half-coiled, snugly around, or by the side of the crown or corm, as the root is called. Here they lie in little round balls, somewhat like Potato-apples, only smaller, for many weeks, when the sly little rogues will all of a sudden burst, and sow themselves, if not watched closely. The moment the seed-balls are about to burst they must be picked and also sown, for there is no occasion for much ceremony, except that it will be well to let them lie a few days, in order that they may burst their bonds by a natural process. Their seeds will be ripe, usually, in April or May, and a seed-pan should be most carefully preserved for them, as they will not benefit by transplanting during the first summer.

The Cyclamen enjoys much fibrous, vegetable matter, containing a liberal amount of sand; and if I were to pick a compost for them, it would be fibrous and sandy heath soil, a year old chopped to atoms, two parts; leaf mold and manurial matters from old hotbed linings, one part; and a free and light sandy-loam turf, one part; the latter a year old, and chopped very fine, as the heath soil, but not riddled. On this heap I would throw a little of my charred rubbish, and add silver sand in proportion to the requirements of the compost. But, as Mr. Fish well observed, the other day, chopped turf from our road sides, such as may be often found, containing much vegetable remains, and the debris of the road, would, perhaps, grow them equally well, and would, assuredly, in the main, prove a safe compost.

The seed-pan I prepare as follows:—One seven inches deep, by about nine in diameter, is cleverly crocked at the bottom, which has several holes. Charcoal, in about half-inch lumps, is strewed over the crocks in a half negligent way, and a mixture of broken lumps of sandy heath soil and leaf mold, not half-decayed, covers the former drainage to the depth of an inch or so. Over this is placed the compost, which is riddled tolerably fine, and composed as suggested for general culture. The whole is pressed down tolerably firm, so as not to settle any, and the soil being rather dry bears pressing.

The seed is carefully covered, and pressed close, the seeds just out of sight, and then the surface is covered with sphagnum moss, to supersede the necessity of much watering, and of capricious alterations of drought. The pan is now placed in a warm corner of a shelf over some flue or pipes, and will require light sprinklings about twice a week. The young plants will begin to appear in about five weeks, and the sphagnum must be removed immediately. Nothing can be done during the first summer's growth, but to grow them clean, and to water regularly but lightly. When these bulbs are re-potted in the following February, it will be found that they have struck their delicate fibers into the drainage material liberally, and much time will be gained by their rapid increases of strength in the coarse medium below. Nothing would be gained by potting-off or pricking-out, as it is termed, but the contrary; and hence the propriety of so constituting the soil in the seed-pan, as that no derangement of its particles can possibly take place. In all Cyclamen culture, every care must be taken to avoid the earthworm.

These seedlings will go to rest about November, and may be put on a cool shelf, and kept dry until the following February; not, however, quite dried up as a bulb. About that period, the bulbs, or, rather, corms, must be potted in single pots,—the kinds called 60's or three-inch pots; and toward May, when they are filled with roots, they will, if well handled, require a shift into 48's, or five-inch pots. I need add little farther about compost, except to observe, that, as in other pottings, as shifts increase in regard of size, in like manner should size increase in the particles of the compost. These newly-potted seedlings then must be placed on some shelf in-doors, close to the light, and receive most kindly attention constantly. As to heat, nothing more is necessary than a comfortable structure, where extremes of heat and cold are alike unknown. By the ensuing autumn they will be strong corms, each possessing six or eight strong leaves; and these, about September, will evince a disposition for a partial rest, and they may be allowed to enjoy it. Again then withhold water for awhile, or, perhaps, I ought to say, give them a little grudgingly; for as far as

my observation goes, the Cyclamen root ought not to shrivel up, although the leaves will necessarily assume a shriveled condition. Toward the middle of February, or sooner, these two-year-old corms will show flower; and the moment the flower-buds are seen to be forming, a slight increase must take place both in heat and moisture. These young aspirants will produce about a dozen or so flowers this season; but in the next autumn, they will, with the best of culture, produce two or three scores each at least. I may here observe, that the corms, in the month of November of the seedling year, should be about half-an-inch diameter; in the November of the second year, they will be more than one inch; and in the third season, they will be nearly three inches. They will, under good culture, continuously increase; but after they become six or seven years of age they become more sluggish, apt to rot, liable to take very long slumbers, etc., until at last it is scarcely possible to awaken them. I really cannot say how long a Persian Cyclamen might be kept a-going, but it becomes the Cyclamen man to raise fresh seedlings, about once in three years, at least.

I now revert to the management of the two-year-old plants, from which we have but just parted, in the condition of blooming. After flowering, the foliage will, perhaps, appear rather the worse for wear; never mind this; we must now see if we cannot apply the course of practice first pointed to by Mr. Wilmot, as before remarked. It is now some twenty years and more, since I first tested Mr. Wilmot's plan; I used then to grow excellent Cyclamens. Having proved that Wilmot was right, I, to use a Manchester phrase, "put the big pot on." I raised a famous batch of seedlings, and these, with the addition of a few very good old plants, set me up in this business. The old plants I at once worked on in the Wilmot style, and the young ones I coaxed up to the flowering point.

I must now state how I carried out the Wilmot idea: I hope I am right in the name, for I write from memory alone. The plants being past blooming, the leaves somewhat sere, perhaps, and the season advanced,—say the middle of April,—a bed was prepared in one of the warmest parts of the kitchen-garden, on a dry bottom. A few inches of half-rotten leaves were dug in roughly; no "pointing," or making fine the surface. Over this, a compost was leveled, nine inches in thickness, of the very soil Cyclamens love, viz., sandy loam, heath soil, and half-decayed hotbed linings, the latter containing dung in the mixture. This, thoroughly blended, after being spread, was compressed with the spade, and in this the Cyclamens were planted, with their balls of earth entire, the soil being pressed firmly to them sideways. I ought here to observe, that previously to planting them out, they were subjected to fumigation, for they almost invariably become infested with aphides by the time they are exhausted by hard blossoming. After this they were merely kept free of weeds, and watered when dry; and, by the end of August, these stout corms would begin to form scores of blossom-buds. At this period they were potted; and if good practice had been pursued, wide-mouthed pots become requisite.

I suppose I have been what some persons would, in a hasty fancy, term a revolutionist, for I have been in the habit of breaking through the conventionalities of our potters. I never could discover why we are forever to be men of 60's, 48's, 92's, and 24's, especially seeing that no act of parliament infringes on this question. A well-grown Cyclamen, like a well-grown cluster of Achimenes, requires what our gardening gents term a pan, or, as we generally find it characterized, "a seed-pan."

A pan for a very strong specimen should be barely seven inches deep, by nearly nine in diameter; nothing looks worse than to see a plant, lone and tufty in character, stuck in a tall and narrow pot. Moreover, in deep pots the drainage is more apt to become deranged. Abont the end of August, then, they may be potted, great care being taken over the drainage, and, henceforth, they will require to stand on some comfortable greenhouse shelf, near the light; if over a flue or pipe, so much the better, unless the heat be very strong. They will require regular waterings, moderate at first, but advancing with the increase of foliage, and by November they will be beautifully in blossom, and continue so through the winter. If a long succession is required, some may be kept back in a cool frame, for they will endure half-a-dozen degrees of frost tolerably well if kept hardy previously.

Thus, then, may proceed their culture annually; and those who have been accustomed to starve them in pots, will be surprised at the freedom and vigor of the fibers when they re-pot them from the open bed.

Those who are commencing this kind of culture should be particular in selecting highly fragrant kinds to breed from. There is a spurious kind abroad, having poor white flowers, quite scentless. The best way will be to purchase when in blossom.

R. Errington.

Plant Something.

A flower, a tree, a shrub,—for ornament or for fruit; for yourself or some one else; somewhere, anywhere,—plant something. It shall grow and prosper and produce beauty or fruit for somebody. It shall not grow in vain.

Shortening-in Peach-Trees.

I find, as far as my experience and observation go, that the shortening-in system does not come up to the anticipations of those who have practiced it on peach-trees, as recommended by DOWNING. Peach-trees in the northern cold latitude are apt to have a portion of their fruit buds killed when the mercury falls below zero, especially when they have become somewhat swollen by previous warm weather, during the fall or winter. By shortening-in, another portion of the buds are destroyed, leaving very few to set for fruit. All of our fruit-bearing trees, while the branches remain upright, bear but little; but place them in a horizontal position, and they are rendered fruitful. It is often remarked by people, when the branches of trees are weighed down almost to breaking by snow and ice, that the next year will be great for fruit. This shortening-in has a tendency to keep the branches upright and cause an excess of leaves to grow while the trees are young. I have found, in all cases, that when an excess of leaves grow on peach or pear-trees, that the fruit is astringent and ill-flavored, and not properly developed. But at the South, where the peach-trees actually bear themselves to death, this shortening-in should be practiced, thereby rendering their trees longer lived. In this northern country, to succeed in peach growing, there are a few things very important, but which are commonly overlooked; hence so much disappointment. First, it is necessary to have land with a dry, warm subsoil of gravel, sand, or loam. Second, adopt a regular system of cultivation to some hoed crop, such as beans, corn, potatos, until the trees come into full bearing. Then the cultivation should be continued, but the ground should not be planted, nor should any weeds be allowed to grow, as the latter would have as bad an effect on the crop of fruit as if planted to either of the former crops. I have known peach-trees, when planted on clay soil with a retentive subsoil, to be loosened by the high winds of autumn, and be switched and twisted until the texture of the roots was destroyed or rendered incapable of furnishing further nourishment to the tree. In this case, although apparently alive, they would not leaf out in the spring. There is one notion in regard to peach-trees which I will here mention. It is to place snow and ice around the trees in winter, and cover it with straw, saw-dust, tan, &c., to prevent it from melting, and by this means prevent the trees blossoming early, or not until the frosts of spring are over. Now, for the benefit of your readers, I will say that such a notion is entirely fallacious; for a peach-tree will blossom and leaf out, if not diseased to a certain degree, without any assistance from the roots. Who does not know that a peach-tree transplanted when in full bloom, will grow admirably? Such is the case, because the roots have not yet started to grow, but do immediately after. Another instance will illustrate this. Plant a grape-vine outside of a greenhouse where the ground is frozen. Take the top through an aperture in the wall to the inside, where the atmosphere is warm, and this vine will put out shoots, blossoms, and set forth fruit, while the roots are yet frozen; but if kept too long in this state, it will perish.

I noticed not long since an article in your paper, relating to a wonderful discovery, made by some Professor, by which he had been completely successful in grafting peach-trees; and for the further benefit of your readers, I will give my experience. I had found that by setting grafts in peach wood of two seasons' growth, no older and no younger, that in most cases they would live and grow admirably. I. HILDRETH.

We, too, have tried the shortening-in system, for several years, upon the peach-tree; and so far from causing the branches to become upright, the head of the tree became rounded like to that of an apple-tree; the limbs radiating from a common center; and though the shortening-in decreased the number of fruit buds, by just the quantity cut off, yet we are convinced that we have had a greater *weight* of fruit by pursuing this system, than if the entire number of fruit buds had been allowed to remain and be perfected.

On one occasion, we selected a spindling tree, just in bearing; cut it down even with the surface of the earth; and from the young shoots that issued from the root, selected four to form one new tree. By shortening-in, we caused this tree to form almost a perfect semi-circular head, with a diameter of about nine to ten feet; the lower branches starting from the ground, and, at their extremities, not three feet above it. In one season, we thinned out and threw away five hundred immature peaches, and allowed the tree to perfect as large a number—all of which were unusually large and fine. The next year we allowed the tree, which we had determined to remove, to retain all its branches, and all its fruit. Instead of furnishing us with a good supply of peaches, the branches were borne *flat to the earth* by the amount of fruit upon it, and not one single specimen ripened.

[The above is from the *Rural New Yorker*, and is introduced as a forerunner to some remarks upon this admirable plan of pruning the peach, which shall be more fully explained and urged in a future number of the Review.]

Everybody's Weatherometer.

BEING NATURAL PROGNOSTICATIONS OF THE WEATHER, GATHERED DURING TRAVEL AND LITERARY RESEARCHES IN EUROPE AND AMERICA.

BY R. E. H. LEVERING.

NO. I.—INFLUENCE OF THE MOON ON THE WEATHER.

The influence of the moon on the weather has, in all ages, been believed by the generality of mankind: the same opinion was embraced by the ancient philosophers, and several eminent philosophers of later times have thought the opinion not unworthy of notice. Now, although the moon only acts (as far, at least, as we can ascertain,) on the waters of the ocean by producing tides, it is nevertheless highly probable, according to the observations of Messrs. Lambert, Foaldo, and Cotte, that in consequence of the lunar influence, great variations do take place in the atmosphere, and consequently in the weather. It would, indeed, transcend the limits necessarily assigned for such articles in the "*Horticultural Review*," to detail the ingenious reasonings of these eminent philosophers, but the following principles, which I have translated and condensed from their profound lucubrations, will show the grounds and reasons for their embracing the received notions on this interesting topic.

There are ten situations in every revolution of the moon in her orbit when she must particularly exert her influence on the atmosphere, and when, consequently, changes of the weather must readily take place. These are,—

1.—The *new*, and 2, the *full moon*, when she exerts her influence in conjunction with, or in opposition to, the sun.

3, and 4.—The quadratures, or those aspects of the moon when she is ninety degrees distant from the sun: or when she is in the middle point of her orbit, between the points of conjunction and opposition, namely, in the first and third quarters.

5.—The *perigee*, and, 6, the *apogee*, or those points of the moon's orbit in which she is at the *least* and *greatest* distance from the earth.

The two passages of the moon over the equator, one of which Monsieur Foaldo calls, 7.—The moon's *ascending*, and the other, 8.—The moon's *descending* equinox, or the two *lunistices*, as Monsieur de la Lande calls them.

9.—The *boreal lunistice*, when the moon approaches as near as she can in each lunation, (or period between one new moon and another,) to our zenith, (that point in the horizon which is directly over our heads.)

10.—The *austral lunistice*, when she is at the greatest distance from our zenith; for the action of the moon varies greatly, according to her obliquity. With these ten points, Monsieur Foaldo compared a table of *forty years'* observation: the result is, that the probabilities that the weather will change at a certain period of the moon, are in the following proportions:—

New Moon,	6 to 1.
First Quarter,	5 " 2
Full Moon,	5 " 2
Last Quarter,	5 " 4
Perigee,	7 " 1
Apogee,	4 " 1
Ascending Equinox,	13 " 4
Northern Lunistice,	11 " 4
Descending Equinox,	11 " 4
Southern Lunistice,	3 " 1

That is to say, a person may bet six to one or seven to one, as the case may be, that the new moon will bring with it a change of weather. Each situation of the moon alters that state of the atmosphere which has been occasioned by the preceding one; and it seldom happens that any change in the weather takes place without a change in the lunar situations. These situations are combined on account of the inequality of their revolutions, and the greatest effect is produced by the union of the syzigies—(syzigy, in astronomy, being a term equally used for the conjunction and opposition of a planet with the sun)—with the apsides, which, in astronomy, are applied to two points in the orbits of planets in which they are at the greatest and least distance from the sun or earth. The higher *apsis* is more particularly denominated aphelion or apogee: the lower, perihelion, or perigee. The proportions of their power to produce variations are as follows:—

New Moon, coinciding with the perigee,	33 to 1
New Moon, coinciding with the apogee,	7 " 1
Full Moon, coinciding with the perigee,	10 " 1
Full Moon, coinciding with the apogee,	8 " 1

The combination of these situations generally occasions storms and tempests; and this perturbing power will always have the greater effect the nearer these combined situations are to the moon's passage over the equator, particularly in the months of March and September. At the new and full moons, in the months of March and September, and even at the solstices, especially the winter solstice, the atmosphere assumes a certain character, by which it is distinguished for three, and sometimes six months. The new moons which produce no change in the weather, are those that happen at a distance from the apsides.

As it is perfectly true that each situation of the moon alters that state of the atmosphere which has been produced by another, it is, however, observed that many situations of the moon are favorable to good, and others to bad weather.

Those belonging to the latter class are: the perigee, new and full moon, passage of the equator, and the northern lunistice. Those belonging to the former are: the apogee, quadratures, and the southern lunistice. Changes of the weather seldom take place on the very days of the moon's situations, but either precede or follow them.

Besides the lunar situations to which the above observations refer, attention must also be paid to the fourth day before the new and full moon, which are called the *octants*. At these times the weather is inclined to changes; and it may be easily seen, that these will follow at the next lunar situation. Virgil, the ancient bard and ruralist, calls this fourth day a very sure prophet. If on that day the horns of the moon are clear and well defined, good weather may be expected; but if they are dull, and not clearly marked on the edges, it is a sign that bad weather will ensue. When the weather remains unchanged on the fourth, fifth, and sixth day of the moon, we may conjecture that it will continue so till full moon, even sometimes till the next new moon; and in that case the lunar situations have only a very weak effect. Many observers of nature have also remarked, that the approach of the lunar situations is sometimes critical for the sick.

Having referred to the observations of Foaldo and de la Lande, on this interesting subject, I will introduce the observations of a German naturalist of the eighteenth century, on the *influence of the moon in regard to extraordinary years*. Bad years take place when the apsides of the moon fall in the four cardinal points of the zodiac. Their intervals, therefore, are as four to five, eight to nine, &c., or as the intervals of the passage of the apsides through the four cardinal points of the zodiac. Thus the year 1777 was a bad year, and in that year the apsides of the moon were in the equinoctial signs; and it is probable that the years in which the apsides fall in the signs Taurus, Leo, Virgo, and Aquarius, will be good and moderate years, as the year 1776 really was; and in that year the apsides of the moon were in Taurus and Virgo.

Every eighteenth year must be similar. We, however, can not depend upon a return altogether the same, on account of the three different revolutions of the moon; and, therefore, it may happen that the epoch of this extraordinary year may be retarded a year, or perhaps two. Though approximations only are here given, this does not prevent their being useful to farmers, if they only pay attention to circumstances. Besides, various exceptions must be made for different parts of the earth; and it is difficult to determine these beforehand, as what regards this system is applicable to the whole globe; but when the result of the system has been improved by local observations, the conjectures for each country will be attended with more certainty.

The fifty-fourth year must have a greater similarity to the first than all the rest; because, at this period, the situations of the moon, in regard to the sun and the earth, are again found in the same points.

The quantity of rain which falls in nine successive years is almost equal to that which falls in the next following nine. But this is not the case when we compare in like manner the quantity of rain which falls in six, eight, or ten years.

Lancaster, Ohio.

[It is, of course, well understood that we do not indorse all the views of our various and many-minded correspondents. We cheerfully give a hearing to many whose opinions do not correspond with our own. In the present case, the writer is capable of speaking for himself, and we are quite willing to allow him the opportunity.]

Editor's Bureau.

Editorial Correspondence.

THE STRAWBERRY.

The following letter will be read with interest. We thank the writer for his good opinion and kind expressions. I am more convinced than ever, that the strawberry discussion has arisen altogether from a misunderstanding between the different parties to the controversy, touching the import of certain terms and expressions used by cultivators to explain their views. It will be seen by the "finality" adopted by the Cincinnati Horticultural Society, that they mean only to say that an *individual* will retain its peculiar characters, however extensively multiplied by cuttings and offsets, and that they do *not* mean that it will *transmit* its peculiarities by natural process of propagation by seed. This explanation may quiet the minds of certain objectors. The statement is made, also, chiefly in regard to certain cultivated or artificial varieties. That an *individual* may have certain peculiarities, differing from the natural characters of the species to which it belongs, will be readily admitted; and that it still remains the same individual, no matter into how many parts and pieces it may be cut, or how widely those pieces may be scattered, will be also admitted; there is, then, no reason to doubt that each fragment so separated will, when rooted and grown, present the same characters and peculiarities as did the parent from which it was cut. There is no real ground of controversy in the case. A communication from Mr. Longworth on this subject is necessarily deferred. J. W. W.

WEST CHESTER, PA., April 13, 1854.

J. W. WARD, ESQ.—

Dear Sir:—Some time last year I received a *prospectus* of a monthly journal, to be entitled "The American Botanist," and if I rightly recollect, I ventured the ungracious opinion, that a work devoted exclusively to "the amiable science" would hardly be found *to pay*, in this utilitarian age, and "go ahead" country. That opinion was formed from the observations of half a century, in which I had witnessed the failure of several similar attempts. But I think I added, that if the work did go on, you might consider me as a subscriber. A few weeks since, I have received a copy of "The Horticultural Review and Botanical Magazine," No. 2, for February; and to-day I received No. 4, of the same work, the annual subscription for which is enclosed. I suppose this to be the work originally projected, and think the portion I have seen does great credit to the taste and spirit of the West, and if *the West* has taste and spirit enough to appreciate and sustain so laudable an enterprize, it will cover itself with honor, and put the shabby *East* to shame. Were I younger, I should be proud to enrol myself as a *permanent subscriber.*

I perceive, in the number received to day, (No. 4,) that you have given a very judicious paper, on what is called "*the Strawberry Question,*" which has been making such a rumpus among the cultivators of that plant. Like many other controversies, it seems to be owing to the parties not being sufficiently explicit in defining their respective positions. The whole affair seems to me to be a sheer question of *fact*, to be determined by observation, and if the *admitted facts* were distinctly and *properly stated*, as you suggest, I do not see how or why there should be any dispute at all. Every body knows, or may know, that the *stamens* and *pistils* of flowers are liable to be defective or abortive, especially in plants which have been long under cultivation. This is remarkably the case in the strawberry plant. Now, as I understand the question, which is disturbing the equanimity of sundry gardeners, it is simply this: Is it possible for a strawberry plant which usually bears flowers with imperfect or *abortive stamens*, to be made to produce flowers with *perfect stamens?* Mr Meehan, who is both a professional gardener and a respectable botanist, observed *both perfect and imperfect flowers* in a bed of what he supposed to be Hovey's seedlings, and ventured to ascribe the phenomenon to the influence of culture.

The *change*, thus alleged, from imperfect to perfect flowers—i. e. from *abortive* to *perfect stamens*,—was pronounced to be "utterly impossible." Having had an opportunity to examine one of Mr. Meehan's specimens, and finding *both sorts* of flowers on the same plant, I thought the inference quite logical, that there must have been *some change, to produce both sorts*, whether the parent plant was pistillate, staminate, or perfect. I thought the *possibility* of the change was sustained by *analogy*, in many other plants. It was then *denied* that Mr. Meehan's plants were *Hovey's seedlings*. *That* is a question of fact to which I have nothing to say, because I am not practically familiar with the characteristics which distinguish the many *varieties*, or cultivated sorts. But I confess myself unable to comprehend why *Hovey's* should be *immutable*, while others are liable to change. If the fact of *change*, in *any* cultivated variety, be admitted, the main point would appear to be settled; and as it respects *Hovey's seedling*, that must be left to future observation. No doubt, some varieties may be more fixed, or persistent, than others; but it would require many years of *negative* evidence to prove that a change was "utterly impossible," as is claimed. I should really be glad to know what is the exact position of Mr. Meehan's opponents. Do they mean, and will they say, that the organs referred to *never change* under any circumstances? or is it *only* with regard to *Hovey's seedling*, that the change is pronounced "impossible?" I am persuaded, that a clear understanding of the precise matter in dispute is all that is wanting, to allay the ferment. I am mortified to learn, that there has been some loss of temper among the disputants, which I think very silly, uncalled for, and unbecoming among the cultivators and amateurs of Natural Science. We are not responsible for the *facts* in nature. All we have to do, is to find them out, and good-humoredly make them known.

Very respectfully, your most obedient,

Wm. Darlington.

[Our correspondent is well known in Botanical science, and we shall hope to hear from him again and often. His closing words will not, we trust, pass unheeded.]

Sterling, *Whiteside Co., Ill.*, April 10, 1854.

Messrs. Warder & Ward—

Dear Sirs: It has been my intention to send you a few notes in relation to this new and distant region of the West, but the hurry of business at this season puts it entirely out of my power.

With pleasure I read your pages, and trust your labors will be duly appreciated by the friends of pomology throughout the West, and not only there, but wherever pomology has found a home.

Your views on hedging should be read by every farmer on these broad prairies, and I doubt not that the plant which you recommend above all others, the Maclura, is the one best adapted to that purpose in the latitude, or rather locality, in which you reside. You say, if I rightly understand you, that it is by far a more rapid grower than the buckthorn. With me it is the very reverse. From an experience of five years in growing the plants side by side, I must give my decided preference to the buckthorn. My impressions are, that it is not as hardy as the peach, three years' old plants being killed to the ground during the winter of 1851 and '52, while the peach-trees standing near remained uninjured.

In justice to so important a subject, I regret that I can not say more.

Our country here is new, and but few feel able to take a journal entirely devoted to horticulture; as it is, however, you may expect a few readers from this county.

I remain, Yours truly,

L. S. Pennington.

The interesting article on vegetable organic cells, in our present number, by Prof. Riddell, is extracted from a lecture on the subject delivered to the Chem. Class of the University of Louisiana, when it was largely illustrated by magnified drawings and diagrams. These we were unable to produce for our extract; nor are they really necessary to an understanding of the views advanced.

Several articles on botanical matters are omitted from the present number, for want of room.

MONUMENT TO MR. DOWNING.—The committee appointed at the last session of the American Pomological Congress to obtain funds to erect a monument to the memory of the late A. J. DOWNING, have received for this purpose about one thousand dollars. The Horticulturist states that it is proposed to place it in some of the public grounds at Washington, and that the design is a vase of pure white marble, elaborately carved, on a pedestal bearing a suitable inscription. The whole to be nine feet high.

MR. PARDEE, the great Strawberry cultivator, is out upon Mr. Hovey in regard to the "Superior" strawberry, in the *Am. Agriculturist*. I have feared that Mr. H. had not the true variety when I read his description last year. It is evident that Mr. P. has had and seen that which is correct. This only reminds one of the often accidents which should not be allowed to occur, but which will constantly be liable to recur with nurserymen, how honest soever, who do not make a speciality of the strawberry, and give the subject personal attention, and keep the sorts separate.

J. A. W.

AN ANNULAR Eclipse of the sun, visible generally in the United States, will occur on the afternoon of Friday the 26th inst.: commencing, at this place, about four o'clock, and lasting till twenty minutes after six. A rare and beautiful phenomenon.

State Fairs.

NEW YORK HORTICULTURAL.—Preparations are making for the Spring Exhibition, which is to be held at the American Museum (Barnum's) from the 1st to the 6th of this month. The premium list amounts to more than $300.

The American Agriculturist anticipates a highly creditable exhibition.

NEW YORK STATE AGRICULTURAL SHOW.—This Fair is to be held at Hamilton Square, New York City, on the 3d to 6th of October. This park embraces eighteen acres, and is considered a very favorable location. The facilities of locomotion and every accommodation offered by the great metropolis, are set off against a more central position. A great show is anticipated.

THE NEW HAMPSHIRE STATE FAIR, will be held on the first week of October, 3d to 6th. The place has not yet been selected.

THE CONNECTICUT STATE AGRICULTURAL SOCIETY, will hold its first fair at New Haven.

New Books, etc.

AMERICAN FRUIT-GROWER'S GUIDE.

This is a new fruit-book, by our fellow citizen, F. R. Elliott, of Cleveland, who has been devoted to pomology for several years with such unusual ardor that he deservedly stands among the first pomologists of our country. In preparing this work, he has availed himself of the valuable information derived from Prof. Kirtland, Mr. Hoadly, and others familiar with the subject. A careful review of the book gives a very satisfactory result, for though in its first edition it is not without its trivial errors, all readers, and especially those in the West, will find it a valuable aid in their investigations. It contains quite a large number of fruits not described in any other systematic work, and in the department of cherries, especially, it is replete with interest and novelty.

The engravings are a great improvement upon the cuts generally used in similar illustrations; a degree of shading about the cavity and basin, gives rotundity to the sections of fruits, while the capsules and seeds and stones represented, are valuable characteristics.

Hon. Mr. P. Wilder, the prince of pomologists, speaks as follows, after acknowledging the receipt of the work:

"I have examined its pages with unusual interest, and the more I perused them, the more I was gratified with the extensive information it contained, and the great amount of investigation it required to place before the public this most valuable book.

"Although the study of pomology has been the great absorbing subject of my life, yet I am happy to acknowledge that your "Guide" has already afforded me much instruction, and will be a most useful work for reference. Every cultivator of fruit in the country should possess it.

"There are a few errors, but the wonder is, not that any exist, but that you have been able to present so perfect a work in your first edition, and one which embraces so much useful information for pomologists in general."

TRANSACTIONS.

The Cincinnati Horticultural Society,

Has kept up its meetings with accustomed spirit during the past month. Several topics of interest have engaged the attention of the members, and elicited discussion; among them, the strawberry, and its peculiarities of inflorescence, has proved a fertile theme, which threatens to have no terminus, unless the report of the Secretary, after his return from Philadelphia, should happily set the matter at rest for a season; meanwhile, the plants are coming into blossom, and every one may verify the statements for himself. The publication of this report has been called for, and it is inserted to gratify friends, although the writer would have preferred to have it simply put on file by the society.

The fruits of the past season have almost disappeared from our tables, and cut flowers have not yet come to take their places. Every morning the market stands present a more attractive horticultural exhibition than our hall. Some contributors, however, still favor us; among these have been S. S. Jackson, with his seedling verbenas, and Henry Williams, with a rich display of roses and other flowers. We must now expect increased interest in our meetings and displays. The spring exhibition, it is proposed, will be held toward the end of May.

REPORT.

President and Members—At the risk of being tedious, I shall proceed, with as much brevity as possible, to comply with your request, and give a statement of how I found the "*Strawberry question*" on my recent visit to Philadelphia.

Armed with the facts familiar to you all, and having blossoming plants of three varieties, that have evidently been much confounded by those eastern observers who have been preaching the instability of what we know to be characteristic peculiarities of different varieties, and which we have every reason to believe are permanent, I felt prepared for the discussion, but was filled with regret that so much feeling of an unpleasant character existed among some of the members of the Pennsylvania Horticultural Society, that it was not desirable to convene that body, in order to give me an opportunity to explain and discuss the great question openly and fully. I was, therefore, obliged to content myself with repeated exhibition of the plants to individuals, and the exposition of the postulates that we have here derived from our long-continued observations. This was done to many of the members privately, which greatly increased my labor, and proportionately diminished my satisfaction as an apostle of simple natural truth.

I found several persons who had seen with our spectacles, and it was satisfactory to discover that these individuals had been the most extensive and closest observers. Of this you have had the evidence in the ad interim report of their Fruit Committee with which you concurred heartily. Others, among whom was the amiable and intelligent editor of the Florist, were unwilling to receive the testimony of living witnesses, acknowledged to be good observers of natural phenomena, and sufficiently advanced in their botanical studies to distinguish, and not confound, the organs of inflorescence—unwilling to receive the testimony of such living witnesses, should that testimony appear to clash with the dicta of the great botanical luminaries, and their descriptions of natural families and species. These constantly referred to the books, instead of waiting to verify them by a strict comparison with the natural objects they attempt to describe. Some would almost incline to declare that Hovey's Seedling, McAvoy's Superior, &c., &c., were not only not of the Rosaceæ family, but that they were not even strawberries. If it were true that their blossoms were not furnished with all the proper organs of a perfect flower—if these irregularities, which I asserted to be characteristic, natural, and permanent peculiarities, of the genus Trajaria, "be real," said they, or one of them, "*Botany is false!*" To which I responded that Botany was my friend and much beloved; but it was not yet a perfected science, and I hoped they would aid me in rendering it more worthy of our love and confidence, by fearlessly correcting the errors or omissions of our predecessors, instead of blindly following the dicta, even of the wisest men who have worshiped at Flora's shrine.

Among those who have taken the other side of this question, the theoretic side, was one of great eminence in botanical knowledge, whom I did not have an opportunity of meeting, but whose article in the *Farm Journal* was calculated to do much mischief, on account of its tendency to generalize from facts observed in other plants, but which were not at all parallel to those of the strawberry. I may refer to Darlington's discussion of the seed (*fruit*) of botanical language. He rightly asserts that the pulpy mass of many plants, constituting what the world knows as their fruit, may swell and become edible without a perfection of the seed or fruit proper: had he observed the habits of the plant in question, he would have known that such is never the case with the strawberry, but that the perfectness of the development of the fleshy receptacle is in direct proportion to the perfection and consequent vitality of the seed upon its surface. That a fig, a grape, an apple, or a chestnut burr (*capsule*), may be well developed, although it contains not a single perfected seed (*ovule*), is no argument that a different state of things should not exist with the strawberry, although with cumulative evidence of the kind introduced, the *inference* might have been drawn, but for the opposition of well-established facts.

Mr. Meehan, the great originator of the changeable theory, I did not have the pleasure of meeting. This I considered a great misfortune, for I felt a high admiration for his many good qualities as a man and a florist, and respect for his extended information, and believed that what I consider his errors, have arisen from a want simply of accurate and minute acquaintance with the varieties of the

plants he had to deal with. The specimen he exhibited to the Society in February, I saw, and hesitate not to pronounce that it was not a plant of the Hovey's seedling, nor had it ever come from a stolon or runner of that variety—in its foliage, it resembled the Cushing, (a hermaphrodite variety).

Through the kindness of Mr. Cope, I was enabled to visit the beautiful grounds at Springbrook farm, and there examined the forced strawberry plants in the houses, which comprised several well known varieties, and among them very few of the Hovey's seedling, which Mr. M. seems to have supposed constituted the main portion of the plants upon these grounds.

In conclusion, I shall simply add that the postulates in regard to the peculiarities of the inflorescence of this genus, were repeated to all, as the results of observation and wholly dependable; this was done at the risk of being considered almost a monomaniac. Though familiar to you all, I shall here beg leave to repeat them, that our Society may set itself right before the public—an imperfect statement having unfortunately been copied from our transactions and widely diffused by the press of the country: it is to be hoped that the same medium may be appropriated for the diffusion of the following:

FINALITY OF THE STRAWBERRY.

Whether wild or cultivated, the Strawberry presents in its varieties, four distinct forms or characters of inflorescence:

First: Those called *Pistillate*, from the fact that the stamens are abortive, and are rarely to be found without a dissection of the flower. These require extrinsic impregnation.

Second: Those called *Staminate*, which are perfectly destitute of even the rudiments of pistils, and are necessarily fruitless.

Third: Those called *Hermaphrodite*, or perfect, having both sets of organs, stamens and pistils, apparently well developed. These are not generally good and certain bearers, as we should expect them to be. With few exceptions, they bear poorly, owing to some unobserved defect, probably in the pistils. One tenth of their flowers, generally produce perfect and often very large berries.

Fourth: A rare class, a sort of *subdivision* of the preceding, has not only hermaphrodite flowers, but also some on the same truss that are of the pistillate character; and sometimes, in the same plant, a truss will be seen, on which all the flowers are pistillate.

Now these four divisions are *natural* and *real*; they are also founded upon permanent characters, so far as we have been able to discover, after a most thorough investigation, extending through a long series of years, during which millions of strawberry blossoms have been examined with the severest scrutiny. Other forms may exist, and it is not claimed to be impossible that we may yet find a seedling which shall have the general character of a *pistillate*, that may show an occasional perfect or *hermaphrodite* flower, as a peculiarity of that individual, but we have never yet observed such a variety; and further, we believe, that whatever impress, as to peculiarities of foliage, pubescence habit, inflorescence, or fruit, each distinct seedling may receive with its origin, it will be retained in its increase by runners, so long as the variety remains extant. Seedlings may vary from the parent, but off shoots will not be materially different, except by accidental malformation or by development of unimportant organs.

J. A. W.

American Wine-Growers' Association.

At the January meeting, the election of officers resulted as follows:

President—L. Rehfuss.
Vice President—George Graham.
Treasurer—R. Buchanan.
Secretary—John A. Warder.

The President, in assuming anew his position at the head of the Society, expressed his thanks for the honor conferred upon him and also for the support which the members had rendered him during the past year, in the endeavors which have been made by the Society to advance the best interests of the vine culture.

At a previous meeting of the Society, the following premiums were offered.

1st. A silver cup, with inscription, value $30; to be given for the best managed vineyard of not less than two or three acres, the committee to be appointed at the March meeting.

2d. A silver cup, value $10; for the best old Catawba wine three years old or over to be awarded on the last Saturday of March, 1854.

3d. A silver cup, value $15; for the best Catawba wine of 1853, the samples to be taken from a barrel of not less than thirty gallons, to be awarded in July, 1854.

4th. A silver cup, value $10; for the best wine, other than Catawba, made here either from native or foreign vines, and to be awarded in July, 1854.

5th. A silver cup, value $20; to be awarded in August, 1854, for the best Sparkling, made from Catawba wine.

At the February meeting, quite an interesting discussion was had respecting fabricated or adulterated wines, and regrets were expressed that some such had already appeared in our market, whereas, all good wine makers preferred to see only a pure article offered. The president read a paper or report upon the subject of mashing the grapes before pressing the wine.

At the meeting in March, the committee went into a careful examination of the specimens presented, seventeen in number, all choice samples of old wine, running back to the date of 1840. So fine an array of choice old wines was perhaps never before brought into competition together, embracing several of previous premium wines. Of course the decision required great care and good judgment. After selecting and re-selecting, until the comparison was reduced to two competitors, it was decided that Mr. Yeatman's vintage of 1847, was entitled to the cup. Almost every sample on the table was worthy of the premium offered, and they gave evidence that our wine-makers are determined to produce a pure and unadulterated article or leave the field.

Kentucky Horticultural Society.

At an election held at the Merchants' Exchange, in the city of Louisville, on Saturday, 18th March, 1854, the following officers were elected for the ensuing year, viz:

President—Laurence Young.

Vice Presidents—Edw. D Hobbs, C. C. Carey, J A Moore, Wm. Mire, George Herr, H. P. Byran

Executive Committee—George Hicks, Philip Speed, Thos. S. Kennedy, A. Pennington, Arthur Peter, George Heinsohn, Edward Wilson.

Treasurer—A. G. Munn.

Recording Secretary—Ormsby Hite.

Corresponding Secretaries—Dr. L. P. Randall, Dr Thompson.

At which meeting the recording secretary was ordered to subscribe and pay for fifty copies of the Horticultural Review and Botanical Magazine, published in Cincinnati, Ohio, by Dr John A Warder and Mr. James W. Ward, to be distributed as premiums during the present year, by the President and Executive Committee for articles of merit exhibited at the weekly meetings of the society.

[The thanks of the Horticultural Review are certainly due to the society for this amiable act, especially so to the mover of the resolution, and practically, heartily, to the executive officer, the excellent Secretary — to all, all honor. The example is worthy of emulation.]

American Pomological Society.

The Fifth Session of this National Association, will be held at Horticultural Hall, in the City of Boston, Massachusetts, commencing on Wednesday, the thirteenth day of September next, at ten o'clock, A. M.

It is intended to make this assemblage one of the most interesting that has ever been held in this country, on the subject of Pomology All Horticultural, Agricultural, and other kindred Associations, of North America, are therefore requested to send such number of Delegates to this Convention, as they may deem expedient.

Pomologists, Nurserymen, and all others interested in the cultivation of good Fruit, are also invited to attend the coming session.

Among the objects of this Society, are the following:—

To ascertain, from practical experience, the relative value of varieties in different parts of our widely extended country. To hear the Reports of the various State Fruit Committees, and from a comparison of results, to learn what Fruits are adapted to general cultivation; what varieties are suitable for particular localities; what new varieties give promise of being worthy of dissemination; and especially, what varieties are generally inferior or worthless, in all parts of the Union.

In order to facilitate these objects, and to collect and diffuse a knowledge of researches and discoveries in the science of Pomology, Members and Delegates are requested to contribute specimens of the Fruits of their respective districts; also papers descriptive of their art of cultivation; of diseases and insects injurious to vegetation; of remedies for the same, and whatever may add to the interest and utility of the Association.

The Massachusetts Horticultural Society has generously offered to provide accommodations for the Society, and also to publish its proceedings free of expense.

All packages of Fruit intended for exhibition, may therefore be addressed as follows:—"For the American Pomological Society, Horticultural Hall, School Street, Boston, Mass.;" where a Committee will be in attendance to take charge of the same.

All Societies to be represented, will please forward Certificates of their several Delegations, to the President of the American Pomological Society, at Boston.

Marshall P. Wilder, *President.*

H. W. S. Cleveland, *Secretary.*

Boston, Mass., April 1st, 1854.

Mobile Agricultural and Horticultural Society

The regular monthly meeting of this Society was held on Wednesday evening, 5th inst., C. C. Langdon, President, in the chair, and B. C. Rowan, Secretary.

The minutes of the previous meeting were read and approved.

The President then announced the standing committees:—Executive, on Agriculture, on Horticulture, on Floraculture, on Vegetables, on Premiums.

The Corresponding Secretary, W. W. McGuire, read to the Society several letters from kindred Associations, in different parts of the Union, and presented numerous pamphlets, mostly forwarded by Dr. Warder, of Cincinnati, containing addresses, reports, and premium lists.

On motion of A. L. Pope, it was resolved that the Fair appointed for the 19th inst., be postponed until Wednesday, 3d of May.

W. W. McGuire offered the following resolution, which was unanimously adopted:

Resolved, That C. C. Langdon, President, of this Society, be requested to deliver an address before the members on the evening of the 4th of May, being the second of the exhibition.

Botany.—A treatise might be written on the benefits which an acquaintance with the vegetable kingdom is capable of affording. Of how great use is it in strange countries to be able to distinguish the plants fit for food, from such as are poisonous; and to recognise those which have been employed in medicine, or in any one of the numerous arts to which the vegetable kingdom is subservient! Even an elementary knowledge of botany is of exceeding interest and importance. Travelers in unknown lands know full well that life or death often depends upon their acquaintance with the science—an acquaintance, it may be, not derived from learned treatises, but simply from little more than the ordinary observation of those edible plants with which all persons are familiar. But even this is still a knowledge of Botany.

Gibson & Co. Lith. Cincinnati, O. | Ground laid out by A. Strauch, Landscape Gardner

SOUTH LAWN OF W. R. SMITH'S SUBURBAN RESIDENCE

The Orchard.

NO. III.—SUMMER TREATMENT.

In this number of the orchard series, it is proposed to give some details of the treatment of the orchard, the site and selection and planting of which have been already directed in previous papers. The treatment, especially the summer treatment, of a young orchard, will now be discussed; a specific portion of the proper care of the trees is thus selected, because the whole management of the orchard is too comprehensive a subject to be disposed of at one session, and this being an important topic to a large portion of readers, they will doubtlessly prefer to have fuller details in repeated lectures, rather than the condensed resumé of a hurried compendium, or the curt and less satisfactory briefness of an epitome.

The summer treatment will depend, in a great degree, upon the manner in which the ground had been prepared for the young orchard. According to the best authorities, the soil should have been thoroughly loosened by deep plowing, and, if practicable, subsoil plowing, in most soils, before the trees were set, for such complete culture can never afterward be applied, on account of the presence of the trees. If this kind of preparation has been made, it will be best to continue stirring the whole of the ground, with the plow or cultivator, so as to destroy the weeds and maintain a good tilth during the season; this will require two or more repetitions of the plowing, according to the character of the soil, and the abundance of weeds and grass. The objects above mentioned will be the guide in the work, as to the frequency of its repetition. Many farmers, and others who set out an orchard, feel unwilling to lose all this labor of tillage, without some more immediate and apparent return than the growth of the trees they have planted, and will desire to have some other crop upon the land. Now, it is manifest, that two crops can not be so well sustained upon a given surface as one, but, in our fertile soils, and with the very partial crop of young fruit-trees, set at proper distances, it may, perhaps, be quite admissible to occupy the intervening space with root crops, so as to constitute what the farmers call a green fallow, rather than a naked one; potatos, or other root crops, may, therefore, be introduced among and between the rows of trees, but on no account should crops of grain be allowed to occupy the orchard during the growing state; an almost universal prejudice prevails against the introduction of this class of crops, and it is probably well founded.

Cultivation of the soil among the trees should, if possible, be continued for some years, to secure and promote the rapid and healthy growth of the orchard, even should it be objected that such a thrifty growth of the trees is not followed by early productiveness. Lay a broad foundation for future bearing of large crops, and the coming years will not have to blame you for stinted trees, unable to produce a liberal yield. In the process of cultivation, a few practical remarks may be appropriate in this place. The plow is the great agent of culture, upon which we depend for the comminution of the soil, and its subversion, when we desire to bury the weeds and expose the earth to the influence of the atmosphere, which is ever ready to impart its aërial treasures of gaseous manures, from which, indeed, the chief element of woody fiber is to be derived. The cultivators, of various device, serve to maintain the loose and mellow condition that is desired, and at the same time they effect the destruction of successive crops of weeds. Two or more plowings or stirrings of the soil will be found necessary, and will maintain the requisite mellow condition and freedom from weeds.

In all cases, the use of the plow and cultivator, especially the former, should be guarded with great care, to prevent the injurious contact of the trace-chains and whiffletrees with the bark, that would be otherwise bruised and often removed, to the great injury of the growing trees. The singletrees should be as short as possible, and as the team approaches the rows, an assistant should watch and guard the young trees, by lifting up the projecting portion. Some persons prefer oxen for this culture among trees, upon the supposition and belief that they are more readily controlled in their steady gait, slower than horses, and because the yoke alone is liable to injure the trees, and this is more perfectly under control of the driver. For heavy plowing, the oxen would

be preferred by most operators, but for the light, continuous culture among young trees, the horse, or, perhaps, still better, the small-footed and precise-stepping mule would be preferred.

When plowing among orchards, care should be taken not to open a land between two rows repeatedly, by throwing the first furrow against the tree, but the lands should be alternately opened and gathered, so as to maintain a level surface; unless, indeed, the surface be very flat and humid, when it may have been necessary to plant the trees upon the original surface, and cover the roots with a small hillock of earth; here, the constant "opening" of the lands, by throwing the furrows toward the trees, will be advisable; this soon supplies a series of superficial drains that are beneficial to the orchard. In some of the flat, wet lands of the West, I have seen orchards that had been necessarily treated in this way, and they seemed to have been much benefited by having a diminution of their surplus water.

Cultivation of the soil may be continued for several years, with the best results, as will be very apparent in the thrifty growth, fine foliage, and smooth bark of the trees; but it is very desirable to have it continued at least during three or four summers; after which the surface may be laid down to grass, provided due care be taken to keep a large space cleared about the trees, but no cattle should be allowed to pasture upon the land, except swine, which will destroy insects that are in the fallen fruit.

In some situations, whether from convenience or necessity, the young trees are set in a grass field, which may be rocky, or otherwise unfit for the use of the plow and cultivator. When this is the case, as general culture of the whole area is impracticable, it becomes advisable to pay special attention to the treatment of that immediately occupied by the roots. When planting in such a field, the holes should be dug much larger than required to receive the roots, and of course, much wider than when planting a thoroughly prepared soil. The grass and weeds must be kept under control by digging about the trees to an extent of five or six feet diameter, or more. This digging may be performed at any time during the winter, when the frost will permit, and will require repetition by midsummer, and perhaps again during the season, unless we have applied a most excellent adjuvant, the mulching of the surface.

This digging about the trees should be continued during several years, and will produce admirable effects; but, with all the care that can be brought to bear upon the trees by this and other means, they will not compare with those of the same age that have been thoroughly cultivated. A great mistake in the performance of this operation is often observed in the nicety with which it is done; whereas, the digger should endeavor to cast the soil roughly, and without much breaking of the *spits*. A remarkable degree of dexterity may readily be acquired in doing this in such a manner as to appear very rough, and yet to effect a complete inversion and burial of the grass and weeds. The advantages of this method are: that the roughly-dug soil is less favorably situated for the growth of the next crop of weeds, it exposes a greater surface to the action of the atmosphere and its enriching gases, which are most beneficial to vegetation, and, moreover, it is more favorably situated for the reception and retention of refreshing showers, than that which has been dug with the greatest care, and pulverized so as to leave a smooth and uniform surface. Such digging I do not desire to behold. If the soil be at all stiff, it becomes sad after the first rain, and the sunshine soon bakes it to a crust, or dries it up, leaving great cracks that injure the roots, and expose them to the effects of drought. Some persons, when they desire to stir the soil about the trees, will prefer the heavy two-pronged hoe of the Germans, such as they use in the vineyards, and, indeed, an expert hand will rapidly invert the surface, and bury the weeds, leaving the soil in an admirable condition of roughness. Others, and especially brother Jonathan, will cry out for the light spading-fork, made of the best steel, when engaged in this, or, indeed, any other piece of surface digging; and a famous instrument it is, too, as all can testify who have ever made a practical trial of its merits. Give me the spading-fork of American manufacture, from the best steel and of the highest polish! It is a tool worthy of a sovereign, especially of one of our sovereigns, who may determine to dig out his own fortune by the pursuit of the peaceful art of horticulture, instead of

desiring to carve out his way to renown upon the "bloody field of glory."

So much has been said and written of late years upon the subject of *mulching*, that it must be familiar to all, yet a few words will be volunteered upon this matter, on account of its great importance. The object of mulching is to preserve a certain degree of moisture in the soil, about the roots, by preventing the rapid evaporation from the surface, in our arid climate; it will, therefore, be particularly serviceable in sandy and gravelly soils. The mulch may consist of any light rubbish that may be at command; straw is generally used, and is applied to the freshly-dug soil to the depth of three or four inches; this soon settles down and forms a close coat that prevents rapid evaporation, collects dew, and with it, ammonia, which it retains, ready to be washed down into the soil by the next rain. Chip dirt, from the woodpile, or old tanbark, are very suitable materials to be thus applied, and even loose brush and twigs, the trimmings of the trees themselves, which will retain the blowing leaves, will form a good mulch, and keep the soil loose and mellow beneath; but where accessible, as from a saw-mill in the neighborhood, there is nothing that so well and so neatly produces the desired effect as coarse saw-dust, which, in stiff soils, may be turned in at the winter digging, or scraped to one side, and reserved for application the ensuing season.

Young trees, freshly set out, especially those from crowded nurseries, and where they have been cleanly trimmed up with naked stems, just such as are generally most admired, on account of their resemblance to walking-sticks, perhaps, are frequently obnoxious to serious evils when transplanted to open exposures. The smooth bark is often scorched and blistered, and oftentimes fine young trees are also destroyed by the larva of an insect that lives upon the cambium or young wood just beneath the bark; the worm eats away a considerable surface, often nearly girdling the tree before his invasion is discovered. The latter injury can only be suitably met with the sharp knife, in the hands of the ever-wakeful orchardist, who watches his trees with lynx-eyed vigilance; but the former evil may be prevented by a very simple contrivance, and one that is particularly recommended for the cherry, that has its bare and polished shank exposed to a hot sun, after having been drawn upward in search of light and air in the close rows where it grew. The application consists in a wisp of straw gently tied to the stem, and extending from the branches to the ground. As the trees grow larger, the straw may still be applied with advantage to the cherry, which appears to suffer from sunshine, both in the winter and summer, more than other trees; to the larger trees, a straw rope is used, wound about the stem; but a couple of boards tacked together, and set up to the south and south-west sides, have been found a very efficacious protection. A very worthy clerical friend, who is devoted to pomology, ornaments some of his favorite trees with the remains of his obsolete unmentionables, and declares that they furnish an immunity from the scorching effects of Sol's rays.

In the fertile soils of the Illinois prairies, which appear to be admirably adapted to orcharding, I found that in cultivated ground the trees sometimes continued to make an excessive growth, and that they were in consequence less productive of fruit, though, no doubt, laying and spreading broad foundations for immense crops in future years. Some persons there have discovered that the sowing of grass among the trees, and the cessation of culture, has had the effect of making the trees more prolific, but they also soon observed that the fruit, although abundant, was not only smaller than before, but also inferior in quality, and affected with a hard fungous growth, often known in other parts of the country by the unpleasant name of the scab, but by the pomologists of the north-west quaintly called "grass-fed," on account of its having been observed almost exclusively, and in some places always, in the fruit that has grown in grass fields. In other parts of the country, where orchards are commonly turned out to grass, this disease has been observed, and some others also have been attributed to want of culture, and no doubt, also, to want of manure, that is, to an exhaustion of some of the ingredients necessary to the tree or fruit.

The value and importance of manures for orchards, the effects of destructive insects, and the importance of summer pruning, must be deferred till the next number.

J. A. W.

Influence of Light upon Vegetation.—No. 2.

To the inquiring gardener or cultivator of plants, no subject is more replete with interest, or more calculated to afford him information and instruction relative to the principles on which these charming productions of nature should be treated or managed, than an investigation into the peculiar effects which the various atmospheric influences produce upon them, with a view to his guidance in the regulation and modification of those influences in practical cultivation.

If we reflect upon the fact that, in the absence of a due degree of light and heat, and of a free and constant supply of the more immediate aërial elements, plants and vegetables would cease to exist, we shall at once perceive, that certain proportions of each of these atmospheric principles are indispensable to the cultivation and reproduction of every description of plants. But, if we pursue our inquiries, and endeavor to ascertain the particular degree of these elementary constituents which each tribe of plants or individual species requires, we shall speedily discover that it is a question too intricate for the human mind to solve, a subject almost too impalpable and too complicated for human observation; and indeed it is one, of which the most eminent individuals have, after devoting their whole lives to its consideration, been obliged to confess that they had learnt comparatively nothing. It is sufficient, then, for each succeeding age to know something more of this subject than their predecessors, and to approach a little nearer the goal which all have in view, viz.: a perfect knowledge of the nature, manner, and extent of atmospheric agency in plants. It would doubtless be highly interesting to many of our intelligent readers, were we, in resuming the consideration of the subject of the present article, to treat of it in a chemical point of view; but as we seldom introduce to our pages any remarks of this nature, which have not a direct practical tendency, we do not intend to deviate from our usual course in this instance; and as we have shown the influence of light on stove plants, accompanying our remarks with useful directions for their general management in this respect, we now propose to extend our observations to those singular objects which are usually termed "succulent plants;" but, as it will not be convenient here to detail the numerous genera which are comprised in this term, we shall select the tribe *Cacte*, and the genera *Mesembryanthemum* and *Agave*, as types of the rest, and severally consider these with reference to the subject of light.

We have previously stated, that plants which are of a succulent or juicy substance, require a great degree of light, and are usually found growing in very exposed situations. The numerous species of *Cacte*, which are now cultivated in our collections, are nearly all met with on dry open plains, and seem to be provided by nature for the sustenance of man and animals in those districts where other kinds of vegetables could not exist, and where neither food nor water can be procured from any other source. It is not a little remarkable, that plants of a consistence so watery as those now under consideration, should be found in such localities as we have above mentioned, and be able to endure the scorching rays of a meridian sun with perfect impunity; but this may be accounted for by their having an exceedingly limited number of pores or respiratory organs, so that while they are furnished with organs of absorption to collect all the moisture which can possibly be obtained from the parched soil, they are thus enabled to retain it to such an extent as constantly to preserve them in full health and vigor. M. de Candolle states that various specimens of *Opuntia* are planted by the natives of the surrounding country in the crevices of the old lava at the base of Mount Ætna, in which situations they flourish in such extraordinary luxuriance as eventually to break up the lava into mere fragments, and likewise produce an immense quantity of fruit; a striking proof of their capability of sustaining a great intensity of drought and solar light. Besides the above, it is well known that *Cacte* grow naturally in those localities where they are constantly exposed to the most powerful influences of a tropical or equinoctial sun; and we may from thence reasonably infer, that unless our treatment of them in this respect is assimilated as much as possible to that which they receive in their natural situations, no satisfactory results will ensue from it. Most good cultivators of *Cacte* have the whole

of their succulent plants collected together in one house; and this system is productive of many important advantages; for, when kept along with a collection of stove plants in the stove, independently of the degree of heat and moisture being injurious to them, they can not be supplied with a sufficient quantity of light. A few years ago, we had the whole of our collection of succulent plants placed in a stove; the consequence of which was, that, owing in a great measure to the deficiency of solar light, as well as to the superabundance of moisture, we lost many of our most valuable species, particularly of *Stapelia*, which, in some instances, perished in a few days, without evincing any previous signs of decay. We therefore found it necessary to remove them into a house where light was liberally afforded, and since then we have had the gratification of seeing them thrive most luxuriantly, and flower in a high state of perfection.

From the accounts of travelers, we learn that many species of *Cactæ* produce a great abundance of fruit in their wild and native state; this, we presume, is entirely attributable to the intensity of solar light with which they are naturally supplied; but that the plants which are cultivated in British collections produce little or no fruit, is a fact of which every individual who is at all acquainted with them must be aware. We do not say that *Cactæ* are cultivated, or are worth cultivating, in this country, solely for their fruit, but we would remind our readers that the means which produce fruit, will previously develop the finest flowers, and that these plants are cultivated not only for the singularity of their appearance, but also for the striking beauty of their flowers. To obtain, then, a great abundance of flowers, of rich and splendid colors, no mode of treatment, however plausible and suitable in other respects, can be made to supply a deficiency in solar light, and we consider this fact to be the prominent and most important feature in the cultivation of *Cactæ*.

In the collection of a private gentleman in the vicinity of London, we witnessed, a few months since, some large specimens of *Opuntia vulgaris*, which had for several years been planted in an open border, and trained to the front wall of a green-house; in this situation they produce, annually, an almost innumerable quantity of blossoms, and are succeeded by an equally profuse supply of fruit. Now, it is well known, that this species, when treated as a stove plant, certainly attains to a great size, but seldom, if ever, develops its flowers; so that this deficiency can not be attributed to a lack of heat, nor can it be said to be caused by an excessive degree of it, for its native country, where its fruit forms a staple article of food, is situated in the tropical parts of America. Therefore, we can only account for the above unusual instance of this plant flowering in such profusion, by the circumstance of its being freely exposed to the influence of solar light; and from this, as well as numerous other similar cases which have fallen beneath our notice, we are convinced that the prevailing error in the cultivation of these plants is, not allowing them enough of the important element now under consideration, the consequence of which is, that they generally flower indifferently, and frequently not at all. In a few isolated instances this remark may not perhaps appear to apply, as some gardeners certainly cultivate these plants to an extraordinary degree of perfection; but this excellence is only attained with a few species, and even with these is solely attributable to the plants being periodically exposed to the sun's influences, and not, as is generally supposed, to the variation of temperature. We would, therefore, suggest, as a practical inference from these facts, that these plants be kept in a house where they can constantly receive the unobscured and unmitigated influences of the sun; that they be placed on a stage as near as possible to the glass; and that nothing be suffered to obstruct or counteract the direct and immediate rays of solar light. These remarks refer to the whole tribe of *Cactæ*, but there are some species which will bear exposing to the open air during certain periods of the year; such, for instance, as *Cereus speciosissimus*, *speciosus*, Jenkinsonii, and others of similar habits, and if these are annually placed in an exposed situation in the open air, after they have ceased growing, they will be found to flower much more abundantly, and in far greater perfection, in the succeeding year. Throughout the whole season, and at all stages of the growth, they should constantly receive as much solar light as can be dispensed to them, except during the short period they continue in flower,

when they may be placed at a further distance from the glass, to preserve them in flower for a greater length of time. The variation of temperature and moisture which these plants require, will form the subject of future articles, and we now proceed to offer a few observations on the effect of light on the numerous species of Mesembryanthemum.

The extensive and interesting genus just named, with the exception of the genus Erica, contains a greater number of beautiful species than any other with which we are acquainted, and there is not an individual species of it but is more or less ornamental. It is generally believed, that if these plants are placed in a poor and sterile soil, they may be induced to flower more profusely, and that the flowers will be finer and of better colors. To a limited extent this notion is correct, but it is a great error to suppose that this treatment will of itself be sufficient to produce the effect above mentioned. It is also imagined that, by withholding water from these plants for a time, their flowering may be facilitated, and the flowers rendered finer and more abundant; this is likewise, to a great extent, an equally erroneous hypothesis, if the success be attributed to this treatment alone, as may be sufficiently proved by placing the various species of this genus in a sterile soil, administering water very sparingly or wholly withholding it for a time, and keeping them in a shady or gloomy situation, where the rays of the sun can never reach them; the result of which will be, that they will either produce few and insignificant flowers, or be altogether destitute of them. But if, instead of being kept in this unfavorable position, they are placed in an open exposed situation, where they can receive a great degree of solar light, they will speedily produce a most brilliant display of flowers, and these will continue expanding for a great length of time. It therefore plainly appears that it is the *influence of light* which causes these plants to flower so profusely, and not the nature of the soil or the quantity of water administered; though these latter, doubtless, contribute in some degree to produce the above desirable effects. Indeed, this must be abundantly evident to every intelligent cultivator who has been accustomed to place these plants in the open air; for it is irrational to suppose that poverty of soil, or scarcity of water, alone, would cause them to flower so freely. Mesembryanthemums, then, like most other succulent plants, require a great intensity of solar light to enable them to produce their flowers in perfection; and whether they are kept in the succulent house, or placed in the open air, this important particular should be duly and properly attended to; otherwise, no success will be attained. During the summer months, however, many of the species will flower better in the open air than if kept in the succulent house, as in the former situation they will receive a much greater degree of light, by being more fully exposed to the sun's genial and beneficial influences. With a few observations on the genus *Agave*, we shall for the present dismiss this subject.

The *Agave Americana*, or American Aloe, is a plant that is cultivated in our collections solely for the beauty and singularity of its large and handsome fleshy leaves, as it is very rarely that we succeed in inducing it to flower in this country. This latter defect is commonly attributed to the supposed circumstance of this plant only flowering once in a hundred years; but this fallacy has been so frequently disproved and confuted, that it is unnecessary here to advert to it. In its native country, (the tropical parts of America,) it generally arrives at maturity, and produces its flowers, within a term of ten years; but in the collections of this country, it seldom flowers within the period popularly assigned to it, or, at least, within seventy years, a circumstance entirely owing to the deficiency of heat, but more especially, of light, with which it is supplied. It is true that most cultivators expose their plants of this species to the open air during the summer months, but throughout the long winter season they are usually placed in a dark conservatory or orangery, frequently thirty or forty feet from the glass, and shaded, besides, by other plants. We therefore maintain, that if these plants were constantly kept in an exposed situation, it would not be such an extremely rare occurrence to witness them in flower as it now is. Many cultivators would probably prefer keeping a remarkably fine specimen of this plant in a dormant state, to adopting any measures for inducing it to flower, as it is well known that the plant perishes immediately

after it has ceased flowering. But this we may venture to denounce as a crude and illiberal notion, for it is notorious that this plant may be propagated with extreme facility from offsets, and by this means an abundant succession of young plants may be maintained. As the loss of a fine specimen might thus speedily be supplied with others equally fine, the gratification of having this plant in flower would more than compensate for the destruction of the specimen; and we entreat the attention of cultivators to the importance of keeping this plant constantly exposed to the full influence of solar light, that our collections may no longer be deprived of the extraordinary beauty of the flowers of this singular species.

In conclusion, we would just remark, that the principles we have thus laid down with regard to the necessity and importance of affording certain plants a great degree of light, are equally applicable to the whole of the genera and species comprised in the term "succulent plants;" and that when it is wished to flower any species of this beautiful tribe in perfection, (which is doubtless the chief end and object of every cultivator,) this desirable purpose may be fully attained by due attention to the subject of this article; but if this is neglected, and these plants are kept in a house where a sufficient degree of light is not supplied, nothing but failure and disappointment can be expected to result from such an injudicious and injurious system of treatment.

THE FOUNDATION of all pot-cultivation depends upon having loam, peat, sand and decayed manure, at all times in proper condition. Loam, to be in condition for potting, requires to be laid up in a heap at least eight or ten months, in order that its vegetable fiber may be in a state of decomposition. The best of loams is that produced from very old pastures or commons. The surface should be pared off not more than two inches in thickness. This should be of medium texture, neither too stiff nor too much inclined to sand. Where convenience admits of having two kinds, a heavier and a lighter soil will be found of great advantage in pot-culture, as they will tend to accommodate plants of different habits. Peat, suited for plants, is difficult to obtain in some localities. In choosing it, let it always be procured from a dry, rather than wet, boggy, spongy situations, and it may be necessary to stack it for some time previous to its being used.

Solar Heat.—No. 2.

That heat is eminently instrumental in the geographical distribution of plants, by assigning and restricting those of a certain habit and character to special districts, is indisputable. Almost every climate on the surface of our globe, has a vegetation more or less peculiar to itself; and, although various circumstances concur to effect this limitation, temperature is unquestionably the chief. Indeed, not only does heat, by its presence in different degrees, determine the localization and range of plants of particular and kindred habit, but it is exceedingly plausible and probable, that the modification of heat has tended much to create the diversity of habit in different zones. Thus, the vegetation of each zone exhibits its own peculiarities and characteristics; that is, we meet with plants of a certain habit in their appropriate region, not only because the mean temperature is propitious, but, to a certain extent, and in the lapse of ages, it is extremely likely that the temperature has conduced to the causation of the distinguishing habit existing in such clime.

In endeavoring to ascertain the influence which heat possesses and exercises in the general dispersion of plants, M. de Candolle has very appropriately suggested the following particulars for inquiry; and we shall here follow the arrangement of that distinguished botanist: First, it is necessary to acquire a knowledge of the mean temperature of a country throughout the year. Secondly, the extremes of heat or cold to which it is subjected, at any, and what seasons. And thirdly, the degree of temperature prevalent in each of the different months. A knowledge of the mean temperature of any country, is only valuable to the cultivators of its vegetable productions, when not deduced from contrary extremes. If the climate be liable to any very great depression or elevation of temperature at different periods of the year, the average, amalgamating these vicissitudes, would be quite useless, with regard to its guidance in cultivation. But where a nearly equable degree of temperature is maintained throughout the entire year, the variations on either hand being trifling and unimportant, such data would be of the highest possible utility.

For instance, in tropical regions the derangement of temperature is never great; since, during the period at which the sun's rays are vertical, the density of the atmosphere is so much increased by evaporation, that a very slight difference of the thermometer is indicated, on its removal from a shaded to an exposed situation. We shall hereafter show, that on no other part of the earth the same uniformity of temperature exists; but, even in this case, general information is insufficient for practical purposes; and nothing but minute and careful observation, from residence or sojourn in or near the particular locality wherein a plant is found, can furnish proper materials for its cultivation. So far, then, as those climates are concerned, in which there is the nearest approximation to equability of temperature, vegetation is found to maintain, in some degree, a similar uniformity of habitude and aspect, and, with the exception of a brief period, exhibits a constant appearance of verdure and luxuriance. Perennial herbaceous plants, with soft and succulent stems, trees with evergreen foliage, and very generally destitute of mucilaginous or resinous juices, in short, nearly all the shrubby or arborescent forms, and a great proportion of the herbaceous species of monocotyledones, or endogenous plants, inhabit those districts possessing the above character. On the other hand, annual plants are, we believe, nowhere seen; deciduous trees, likewise, and those which form thick and numerous concentric layers of bark, are almost exclusively confined to regions which present a greater diversity of temperature. Valuable, however, as is a knowledge of the mean temperature of certain portions of our globe, with reference to its influence on vegetation, inasmuch as it teaches that the plants thereto indigenous can not be cultivated with us unless some artificial means be employed for imitating their native climate; correct information respecting the extremes of temperature to which any country is subjected, is of far greater importance, since it embraces a much wider field of observation, and affords more comprehensive and appreciable results. To know that certain tracts are periodically exposed to great alternations of temperature, is to become acquainted with the fact, that the native vegetation of those tracts is capable of supporting and resisting the extremest degree of heat or cold which there occurs. If the observer allows his inquiries to cease here, they will be found essentially defective when the theory which may have been founded upon them is reduced to practice. The state of their functions at the time when these changes take place, and the usual duration of the hot or cold season caused by such alterations, yield only in importance to the extreme degree of temperature. Thus, if a plant be removed from its native climate to one in which the extremes of temperature are nearly correspondent, but occur at different periods, it must by no means be supposed that it will accommodate itself to the latter, until by a gradual and natural adaptation, assisted by artificial shelter at particular seasons, a total change in the era of its periodical functions is effected. Again, there are peculiar districts within the tropics, which, on account of their great elevation, are annually exposed to a considerable diminution of temperature; but though in some such cases, the thermometer ranges equally as low as in the winters of temperate climates, the cold season is by no means so protracted. In attempting, therefore, to acclimatize plants from the former regions, in those last mentioned, some protection must be afforded them on the approach of winter; otherwise, their shoots not having been allowed the natural period to mature themselves, will be liable to serious injury from early attacks of frosts, even though they should be less severe than what they are accustomed (but prepared) to endure with impunity in their native climes. More fully to illustrate our meaning, we may instance those countries which are antipodal to us, and whose summer season consequently occurs at or nearly the same time as our winter. It is obvious that plants obtained from such places will not at once conform to the inversed epochs of our climate; and that the greatest attention is necessary to inure and accommodate them. Nor is the period at which they are removed from their native soil, and their management during the voyage, of trifling importance. Plants taken from such districts at the commencement of their winter, would arrive in this country at the same rigorous period, and thus have to linger through that unfavorable season during their usual stages of growth and development

and immediately after being subjected to all the debilitating circumstances of a sea voyage. This would certainly be prejudicial to them. The best time, therefore, for shipping them, would be the decline of their winter, when we should receive them toward the commencement of our spring.

In introducing any kind of plant from the tracts above mentioned, the advantage of importing seeds in preference to living specimens, will be clearly evident from the preceding remarks. Seeds will not only endure greater extremes of temperature during the voyage, without injury, but they require no attention, and may be germinated at any desirable period after their arrival. Hence, if received during the autumnal or winter months, they may be safely kept till the ensuing spring, before excitation. On the germination of the seeds of exotic plants at a favorable season, we are inclined to believe that much of their subsequent capacity for naturalization depends. If stimulated in the latter part of autumn, or during the winter, they acquire a great degree of weakness and sickliness, and what is still worse, an unnatural habit of commencing their growth at an unsuitable period. This will be, in some measure, retained for a considerable time; and will inevitably retard, if not (by exposing their young shoots to early spring frosts) wholly subvert, all attempts to acclimatise them. On the contrary, by judiciously selecting that month for inducing their vegetation, at which they should afterward commence their annual development, it appears most probable that they will immediately, and without thereby suffering any debilitation, accommodate the exertions of their functions to the vicissitudes of our climate. With those countries which are situated in low latitudes, it is more important that the lowest degree of temperature which they ever experience should be ascertained; while, in proportion as they recede from the equator, a knowledge of both extremes is equally essential. Throughout the temperate zones, and as far as vegetation extends toward the polar circles, but more especially in those portions of the former which are considerably elevated, and where powerful but transient summer heat prevails, it is advantageous to know the highest rate of temperature that exists, as well as the lowest; for in many Alpine districts, it is occasionally found to exceed the usual heat of the valleys of the same latitude. In such cases, vegetation, having only a certain interval wherein to perfect its growth, progresses with amazing rapidity; and plants spring up, mature, and scatter their seeds, and decay, in an astonishingly brief space of time. Climates of very variable temperature, naturally produce plants to which an intense degree, whether of heat or cold, is either not injurious, or decidedly beneficial. Annuals are peculiarly adapted to countries of this description, as they perform the necessary offices for the propagation of their species in a summer, and the oleaginous matters with which their seeds abound, together with the hard integument or rind in which they are enveloped, enable them successfully to withstand the most severe frosts. These, and such deciduous trees as are well coated with bark, or evergreens, in the wood of which resinous or oily juices abound, the buds of both being protected in a very similar manner to the seeds of annuals, or by tough, viscid sheaths, form the principal features in the vegetation of those divisions of the earth which are subjected to great alternations of heat and cold. Herbaceous plants are also abundant, but they assume a very different habit to those of tropical countries; as their stems and leaves annually decay, and those of the succeeding year are duly protected in embryos of a form and nature precisely analagous to those of trees and shrubs. But the best and safest data whereon to found a proper estimate of the influence of temperature on botanical geography, and especially to establish a code of cultivation for any particular species of plants, are accurate observations with respect to the ratio of heat or cold which prevails in any province throughout each month of the year. By this means, not only are the mean temperature, and either or both extremes obtained, but the periodical duration or prevalence of the several modifications is indicated; and we are enabled to arrive at correct conclusions relative to the capability of the vegetation of that province to naturalize itself in any others of which we possess a similar knowledge. Other information is useful, but this alone is entirely divested of vagueness, and reduced to an appreciable and available form. Even

in this case, however, we shall be liable to error if we neglect to take into consideration the difference between the diurnal and nocturnal temperature, and the average duration of each.

Few travelers seem to have thought such information worth acquirement; and probably still fewer have ever allowed their observations to transpire. This is, perhaps, owing, in some degree, to the little attention hitherto bestowed upon the subject by those to whom alone such communications would be valuable—the cultivators of plants. Strange as it may, and does appear, the latter class prefer ascertaining the constitution of a plant, with regard to its capability of enduring cold, by experiments requiring years of tedious investigation, and which frequently occasion disappointment by the repeated destruction of their subject, to a few hours' study of the memoranda of travelers on the temperature of its native climate. It is true that we are at present destitute of the requisite intelligence concerning many districts; but if cultivators would evince greater aptitude to appropriate and employ what we already possess, and thus stimulate collectors to furnish more ample accounts of the variations of temperature in every district from which they procure specimens, it is confidently believed that the practices, both of acclimation and general cultivation, might be based upon such solid and unwavering principles, that there would not be an explored tract throughout the entire globe, on the vegetation of which we should not know precisely what treatment to bestow, the moment the plant and the description of its parent country were received. We entreat attention to these statements from all persons interested in the promotion of either horticultural or agricultural art; and call upon them to assist, by every means in their power, in the attainment of the desideratum herein displayed. Our expectations from this source may appear too sanguine to some, and, perhaps, altogether chimerical to others; but we are thoroughly persuaded that authentic accounts of the particular atmospheric mutations in every district to which plants cultivated, or wished to be cultivated, in this or any other country are indigenous, would, if properly estimated, —carefully compared with the known peculiarities of the climate in which they are desired to be grown and judiciously appropriated and applied—at once put an end to all uncertainties and conjectures that are now entertained respecting their habits, and effect little less than a complete revolution in the culturist's interesting and important practice.

On Scraping and Washing Trees.

Report to the Massachusetts Horticultural Society.

By a vote of the Massachusetts Horticultural Society, on Saturday, the 3d of April, 1854, a committee was appointed to inquire into the present practice of scraping fruit and ornamental trees, and report whether, as a general practice, it was beneficial or injurious to vegetation, and the reasons for its continuance or cessation.

The immediate cause of this inquiry was the regret felt by many at seeing our noble Boston elms stripped of their rough outside covering, with all its wealth of lichens and mosses.

Naturally enough, those of us who study nature as she is at home, and who see daily how wondrous and careful is the provision she makes for the various divisions of her productions, vegetable and animal, can not believe that she could have so constituted the bark of trees as to make it the matrix for varied disease.

It does not seem *natural* that when, from the minutest infusoria to the revolving stars, every thing is adjusted with such exact nicety that in no case one portion of creation shall trench on the rights of another, in this respect of trees' bark no care should have been taken to keep the tree in a state of health, and enable it to deliver itself from all outside intruders. We have thought that if vegetable physiology be true, if the outside bark is really dead, and connected with the live tree underneath, in the same manner that the coat is with the man, any lichens, mosses, or other parasitic plants, were probably connected with that bark similarly to the buttons and decorations of the coat. No man absolutely needs a coat and shirt, yet were he divested of them in this cold and hot climate, his sufferings would be intense; and, therefore, we have deductively reasoned, that the cloth coat of man, the hair of animals, and the bark of trees, are necessary to the respective individuals in the direct ratio of their sensitive natures and vitalities; and just as much as the differently organized animal knows not whether man should wear winter or summer coat, man is unable to decide as to the advisability of reducing a tree to the raw and exposed state.

Investigation has proved to this committee, that whilst arguments have been advanced in favor of scraping, because, 1st, it destroys

lichens and other parasites; 2d, removes dead bark, and the eggs of insects to be, in the summer, injurious to the tree harboring them; and 3d, because, in the opinion of the operator, not alone the health of the tree is improved, but its beauty greatly increased: in reality none of these arguments will or ought to hold good.

But that, 1st, the lichens and other parasites commonly found on well-cultivated trees, grow from the dead bark alone, and have no connection with the life and health of the tree; and that these lichens and parasites, which really indicate the tree itself to be diseased, exist *in consequence*, and are not the *causes*, of the tree's decline. 2d, That no insects, with exceptions hereafter to be mentioned, injurious to the tree's well being, harbor in the outside bark, or may be removed by the before-mentioned process. 3d, That the real beauty of the tree is injured beyond all comparison by any removal, or covering of the natural bark; and, lastly, that nature intended these roughnesses, &c., of the bark, is *proved* by their being so universally the same on the same species, that they are used by botanists as the specific characteristics of the variety of tree.

In order clearly to understand the reasons for the assertion that the common lichens, &c., are not connected with the life of the tree, it is desirable to understand the structure of the stem itself. We find that the seedling plant is composed of an inside pith, surrounded by a layer of wood, which in its turn is enveloped by a layer of bark. The sap from the roots rises through this wood into the upper surface of the leaves, where it is exposed to the light, is matured and elaborated, and thence passes through the lower side of the leaf to the bark, and downward to the roots. In the spring, the newly-started sap passes down between the bark and the last year's wood, where is soon deposited a peculiar substance called cambium, which thickens, and gradually becomes filled with woody fiber, ultimately forming into sap wood, or alburnum; on the inside of the bark is also deposited, from the sap, matter which thickens, and assumes the consistency and nature of last year's bark, called, technically, endophlæum, or inner liber. This liber and alburnum, for the rest of the year, fulfill all the functions of vegetation, and make way in turn for new alburnum, and endophlæum, or liber. It is thus we can explain why, in some cases, when the bark has been stripped from trees, no injury ensued. This formation of wood and bark is completed in about six weeks in May and June. If, at that time, the old outside bark be stripped off just when the cambium is hardening, it will the more rapidly assume the appearance and character of healthy bark and liber, because nature will make an extra effort. The process is analogous to the skinning over of a new wound or burn; but, as in the human flesh, the new skin is very tender, and very much exposed to injury. Probably trees treated in that manner would be very subject to that common disease known as frost blight, which is the freezing of the sap in the vessels of the bark, and their consequent rupture, when the warm spring sun has started the tree into too early activity; and *further, this thin and tender bark* would offer almost free passage to the army of borers, wood-wasps, bark-lice, &c. However great the gain in one crop from this course, and as all horticulturists are aware, the injury or removal of the bark would tend to ripen the fruit earlier, and of a better quality that year, this advantage would be more than counterbalanced by the new liabilities to danger just mentioned.

We have thus seen that the outside bark is pushed ever further from the wood, and its functions exercised by the new bark underneath, until, in process of time, it becomes to all intents dead, and has but little connection with the tree, in many species; (for example, the shellbark and cork oak;) and this very disconnection induces the hasty thinker to remove it.

No one has as yet acquired sufficient intimacy with vegetative processes to predicate the *exact* benefit to the tree of this cortex; but experiments have shown that it is an almost perfect non-conductor of heat and cold, and from its close texture is able to protect the young bark from the ravages of insects, frost, and blight, or any atmospherical disease. If, then, the cortex is dead and disconnected with the living wood below, what reasons have we for supposing that any lichens or parasites existent upon it are able to injure the tree?

In answering this inquiry, it will be well to give the real or supposed reasons of the advocates for the scraping practice. They say that lichens, &c., are parasites, and derive their life from the substances on which they are found; if, then, we find them upon a tree, they must be feeding upon its secretions; and, more than this, as it is known that many trees, young and old, die soon after becoming covered with parasites, their death *must be attributed to the parasites.*

But how much is this assumption worth? It is true that parasites do derive a portion of life from the substances on which they are found, but they are almost universally found upon dead or dying matter, such as the very bark in question; nor is there any reason for supposing that in its healthy, normal state, the living tissue of the tree is ever reached by the roots of the lichens and mosses. It is true, the same species are found upon the living and dead trees, yet on these becoming diseased, or dying, very many new species make their appearance.

* We have taken nature as our guide; how is it with the best *natural* trees? Wherever you select the best specimen, do you not find its bark covered with many parasites? When you look at its noble stem after a shower, how resplendent is it with the rarest colors! But an analysis of the bark of that tree will show that none of the roots of these parasites penetrate deeper than the old bark in which they are imbedded; but if this tree be starved, if its supplies of manure, light, and air are cut off, its system will become rapidly enfeebled; and proportional to the strides of disease will be the increased growth of the former varieties, and the simultaneous appearance of new parasites. *It is only necessary to promote the conditions favorable to this kind of vegetation in order to increase the crop, for they will cultivate themselves.* Reduce the tendencies to decay, manure the ground, drain off the water, bring back the sun and air, and immediately the bark will loosen, and the growth of parasites diminish.

But let us suppose a case; supposing we are about to plant three elms and three apple-trees: for the first apple we will dig a large hole in rich soil, and plant it carefully, giving each root sufficient room; number two should be planted in a poor, wet soil, and number three shall be set, as too many are, in a sort of post hole, in any common land.

Of the elms, number one shall be planted in a large hole, and have the roots well lain out, in some lawn, or other ornamental grounds. Number two shall be set out by the roadside, in pure gravel, but shall have a large hole prepared for it. Number three shall be in a post hole in the gravelly roadside. Now, what fate will any horticulturist predict for these trees? It will be, that the number one apple, and number one elm, will grow splendidly; will want no pruning, more than to prevent limbs crossing each other, and yet, though luxuriant with health, and full of fruit and seed, *they will be found planted with many lichens;* but their very general health will forbid the idea of the parasites injuring the tree, although no doubt many over-careful farmers would remove even them. Numbers two will grow well enough for a year or two, but soon exhausting the soil, will become stunted; and just as soon as growth is checked, new lichens, &c., will appear, and soon cover the tree; but what else was to be expected? Numbers three will never thrive, and year after year, by cutting-in, and coaxing, a semblance of life will be preserved; but mosses, &c., will usurp the entire trunk. Does any horticulturist pretend to tell me aught else could have been expected? * * * *

Geo. B. Emerson, author of the Forest Trees of Massachusetts, says:

"I do not know that there is any reason for thinking that any of the lichens are injurious to the plants, on the bark of which they sometimes live. Many are usually considered as indicating decay, and are commonly supposed to be supported by the substance of other plants already crumbling away. They certainly give infinite beauty to the trunks of trees in old forests, substituting for a monotonous uniformity of color, the boundless variety of tint and fretwork and delicate tracery, which never tire, bringing beautiful life out of death. They may, in the impartial benevolence of nature, sometimes give protection to various stages of insect life, for which we utilitarians feel little sympathy. I should be obliged to put it on the ground of taste. Why mar the beauty which wraps itself around decay?

"Lichens prevail more, I think, as we go further north. Are they not laid upon the surface as a protection from the cold of winter, and the heat of the sun of summer?"

In addition to the above, we give the opinion of Mr. Edw. Tuckerman, who is, perhaps, the best lichenographist in the country, which is as follows: the first extract is from a book published by him in 1845, entitled "An Enumeration of the Lichens of North America," p. 41. "The long debated question, whether lichens injure the bark of trees on which they live, is not to be answered, says Fries, by mere denial! The first three named writers, (Hagar, Hoffman, and Van Luyken,) think that lichens do not injure trees, and the last, (Mr. Merat,) that they do; but altogether they have contributed very little to our knowledge in the matter."

"Hagan considers the whole thing an aspersion upon lichens, and defends them most laboriously." "Mr. Merat, on the other hand, is persuaded that lichens are mischievous plants, and after showing them up to the best of his ability, gravely gives us recipes for their extirpation." "Soils and other circumstances, affecting the health of trees, are so various and uncertain, that in the midst of what seems to indicate power of indefinite duration, we constantly find symptoms of disease and decay." "Unhealthy *young trees* do not long survive after their epidermis is well covered with lichens, and in this stage it seems to be quite futile to remove the latter; but in older trunks the connection of these plants, with any morbid condition of the tree, is often very obscure, as indeed we might expect it to be."

"It is possible that an unhealthy state of the trunk, whether from soil or other circumstances, affords certain favorable conditions for the life and growth of the lichens that occupy it and accelerate its death; or it may be that the lichens themselves induce disease, and accomplish dissolution more quickly and visibly in a young tree, more slowly and obscurely in an old."

"However it be, we assert generally again a probable connection between the life and

growth of lichenose vegetation on trees, and the death of the latter, and infer thence the probability of a law determining in this way the action of lichens on vegetable matter."

In further relation to this subject, Mr. T. says, that he "still believes when the bark of a young tree is covered with lichens, it is doomed, *and beyond the reach of scraping;* but in that of old trees they are of no consequence, except, indeed, so far as they add manifestly to the beauty and interest of the tree, and I should heartily concur in your views respecting this." "There are other unnatural operations in the culture of trees and shrubs, besides scraping, and therefore I feel very unwilling to pass a hasty judgment about what I have had no opportunity to become acquainted with. But I confess that I was shocked when my own few fruit-trees here were scraped, and should rejoice never to have the rough operation repeated upon them." "It must be said, however, that when *mosses* form large thick cushions, as they often do, they are sometimes perfect sponges full of water, and can not but injure what is under them." Thus we see, so far as his research has been able to carry him, he has never found any absolute confirmation of the belief of some, that the *lichens and mosses, as commonly occurrent,* injure the trees; but would discourage the practice, *on this, if no other principle,* that it is not best to violate the manifest regulations and habits of nature, for the mere chance of gaining a doubtful good.

The Rev. John Lewis Russell writes as follows with regard to this question:

"From what observation I have been able to make on the habits of lichens, I feel persuaded that very few, if any, can be deemed injurious to vegetation.

"Parmelia stellaris, very common, grows upon the fruit spurs of pears; and so completely surrounds the spur, as to exclude the atmosphere from the bark of the spur. All lichens, which grow upon living bark, deposit slowly beneath them, earthy substances, perhaps dust, and thus again close the pores of the bark.

"I think that there can be no doubt but that generous cultivation would cause all such lichenose bark to desquamate from the trunk, and leave the smaller branches; and a wash of potash and water, or of whale-oil soap, would, by the presence of the alkali, not only remove the lichens and insects, but give a bright appearance to the tree.

"There are some other smaller species of lichens, such as Parmelia chrysopthalmia, &c., &c., which also grow upon the smaller spray of fruit-trees, but from their style of growth can positively do no harm.

"The living tree or the dead wood, or the inorganic earth or stone, serves only as a place for lichens to affix themselves; the nutriment is borrowed from the atmosphere! Besides, fruit-trees liable to lichens are generally those cultivated in close areas, like small gardens, and as such are more under the eye of the watchful cultivator to apply remedial methods; as syringing with whale-oil soap the upper spray, if necessary; a process used in destroying 'insects injurious to vegetation.'

"The mode of scraping and whitewashing trees is very barbarous; the first, in giving so artificial and shaven an appearance; the last, in injuring the bark by the caustic lime, and the filling the pores with its particles.

"Ornamental trees, or our forest trees long set out for shade and beauty, should never be touched by the scraper or brush, else we lose their sylvan grace. To trim too severely, and to remove the mosses and lichens, are both in exceedingly bad taste, and should be discouraged.

"We do not want works of art in our shade trees; man can not improve on nature in them. No sort of harm can possibly come from their mossy and lichenose character, and the rather perhaps some good, in shielding the inferior layers of living bark from the horizontal rays of a powerful summer day's sun."

"Fruit trees are often baked by this horizontal sunshine, and the bark desiccates and dies of dry gangrene. The same would occur to shade or ornamental trees planted out for decoration, were they not commonly let alone and become *wisely neglected.*"

Having thus demonstrated that in so far as lichens and their parasites are concerned, no benefit will accrue to the tree by scraping its bark, but probably injury, we can next turn our attention to the insects injurious to vegetation. In this portion of our argument we take the book of Prof. Harris as conclusive authority; and as very many persist in believing that insects do harbor under the rough bark of trees during the fall and winter, ready to sally forth in the spring, the following table is prepared to show, first, what insects live upon and in the trees selected, where in those trees they lay their eggs, the kind of injury they do to the trees, and the most effective means for their destruction. The trees selected are the apple, ash, cherry, elm, linden, maple, oak, pear, peach, plum; the list has been confined to these, because fruit-trees have been supposed to be most infested, and the ornamental trees next. Now this table will make it evident that although every tree is the food of many varieties of insect life, the larger number have no connection whatever with the bark, but either live in the wood of the tree, or on the twigs or leaves, in either of which cases, scraping would be of no benefit. It will be seen, upon consulting this list, that the apple, pear, and maple, have two insects, called the woolly aphis and bark-louse, which

deposit their eggs upon the bark near the roots, and in the forks of the branches.

These insects do suck much of the tree's sap, and should be removed; *but it is worse than useless to scrape and wash before we see they are present:* examine the trees, and if they are to be seen, remove them; but rigid iron can not be thoroughly effective in this business. We have learned it is bad to expose the tender liber to the sun and air, by removing the cortex whilst we wish to get off the eggs and insects. The best way to do this is to get a wire brush, like that used by gunsmiths, and with this rub the affected portions of the bark: the wires will readily adapt themselves to all inequalities, and will easily destroy the enemy and leave the bark; this rubbing may be followed by a thorough washing of soft soap. This method is perfectly effectual, and entirely uninjurious to the tree. Caterpillars, as you know, do not destroy the bark, but the twigs and leaves, and are to be removed with the brush and potash, or soft or whale-oil soap. The cankerworm must be kept down the tree by tar, melted India rubber, troughs, or glass bands, and the curculio can be partially escaped by the same method, and by gathering up all the injured fruit, planting the trees in hen or hog yards, or over running water. Many of the borers, (apple, pear, ash,) lay their eggs in the forks of the tree, and near the ground, upon the bark; these may be rubbed off with a wire brush, the tree washed, and then covered with tea lead, or strong sheathing paper, over the affected parts.

Name of Tree.	Name of Insect.	Where found on the Tree.	Death & means of Prevention.
Apple,	Aphis lanigera, woolly aphis, or American blight, ...	Crotches of the branches, and trunk of the tree, near the ground,......	Rubbing with wire brush, and washing with oil soap.
"	Coccus arboreum linearis, conchiformis, cryptogamus, (bark-lice,)	" " "	" " "
"	Geometer, or cankerworm, ...	Leaves and twigs, ...	Tar, India rubber, &c.
"	Hispa rosea, (beetles,)	" "	
"	Elater, "	" "	
"	Archians, (caterpillars,)........	" "	Killed in the nest.
"	Orgyia leucostigma, ...	" "	
"	Liparians, (caterpillars,)........	Glues leaf to the stem, ..	Tear off the leaf and destroy it.
"	Lasiocampians, (lackey, or camp caterpillars,)	Leaves, &c.,............	In the nest.
"	Gastropocha Americana, the American lappet moth,.......	" "	
"	Attacus cecropia.	" "	
"	Notodonta coccinea,............	" "	In the nest.
"	Tree borers,..................	In the wood of the tree,..	By a sharp wire.
"	Cárpocapsa pomonella, codling moth, very rare,		
Ash,	Trochileum denudatum, ash tree borer,......................	In the wood, ...	" "
Cherry,	Selandria çerasi, (slug,)........	On the leaves in numbers,	Sifted lime, &c., to taint the air; showering with oil and soap.
"	Smerinthus myope, Sphinx—uncommon,		
"	Buprestis divaricata,(wood borer,)	Deep in the wood, ...	By a sharp wire.
"	Lasiocampians, (caterpillars,)...	Leaves and twigs, ...	In the nest.
"	Limacodes pithecium, hag moth, (caterpillar,)	" "	" "
"	Notodonta coccinea, (caterpillar,)	" "	" "
Elm,	Vanessa antiopa, interrogationis,	" "	" "
"	Arctia fuliginosa, tiger moth, (interrogationis,)	" "	" "
"	Cimbex ulmi, (saw fly,)........	" "	" "
"	Ceratomia quadricornis, Sphinx,	" "	Kill the insect by picking off.
"	Geometer, or cankerworm, ...	" "	Tar, &c.
"	Tremex Columba, (wood wasp,)	Deep in the wood, ...	Wire.
"	Chrysomela scalaris, ...	Leaves,................	Showering with tobacco-water.
"	Galeruca calmariensis, ...	Rare,	
"	Saperda vestita, (wood borer,) ..	Deep in the wood, ...	Wire.
Linden,	do. do. do. ..	" " "	"
"	Chrysomela scalaris, ...	Leaves,................	Showering with tobacco-water.
"	Vanessa interrogationis, ...	"	Nest.
"	Apatela Americana, ...	"	Showering with tobacco-water.
"	Cankerworm, ...	"	Tar, &c.

Name of Tree.	Name of Insect.	Where found on the Tree.	Death & means of Prevention.
Maple,	Apatela aceris, ...	Leaves, ...	Showering with tobacco,
"	Clytus Hayii, (borer,).........	Under the bark, ...	Wire. [&c.
Oak,	Cynips confluens, (gall fly,)	Leaves, (oak apples,)...	" [and burn.
"	Stenocorus cinctus, (oak pruner,)	Branches,...............	Gather up the branches
"	Buprestis femorata, (borer,).....	In the wood, ...	Wire.
"	Curculio hilaris,................	" "	"
"	Cicada septemdecem, seventeen years locust, ...	Wood and leaves,........	"
"	Membracis univittata, ...	Twigs.	
"	Clisiocampa silvatica, (caterpillars,)	Forks of branches,......	In the nest.
"	Perophora melsheimerii, very rare.		
"	Saturnia maia, (lunar moth,)....	Leaves and twigs, ...	Very rare.
"	Dryocampa senatoria,...........	" "	In the nest.
Pear,	Ægeria pyri, (borer,)...........	In the wood, ...	Wire.
"	Urocerus gigas, (borer,)	" "	"
"	Coccus cryptogamus, (bark-lice,)	Trunk, forks & branches,	Brush and suds.
"	Selandria cerasi, (slug,)	As in the cherry, ...	Sifted lime, &c.
"	Areoda lanigera, (tree beetle,)...	Leaves.	
"	Scolytus pyri, (blight beetle,)...	The egg is laid in the bud, and the grub eats into branch,..........	Cut off branch and destroy it.
"	Cicada, (locust,)..............	Eats the roots badly,....	Uncover the roots and remove grubs.
"	Psyllæ, (plant-lice,)	Leaves.	
Peach,	Ægeria itiosa, (borer,).........	In the wood, ...	Wire.
"	Aphis persiclese, (plant-lice,)...	Leaves,................	Showering soap.
"	Psylla pyri, (thrips,)...........	"	" "
Plum,	Notodonta coccinea, (red hump caterpillar,)	Under leaves, and on forks of branches, ...	Brush and soap.
"	Selandria cerasi, (slug,)........	Same as in cherry.	
"	Plum weevil is supposed to make nests by puncture.		
"	Rynchænus nenuphar, (curculio,)	In the plum and on some leaves, ...	Various methods.

This table contains all the most injurious insects, and many others comparatively harmless. I will not recapitulate the means for their removal or prevention, but will especially call your attention to the fact that it is the fruit-trees, *almost alone*, that need to be protected, and that the much abused elm is more free than any other tree, except the maple and ash.

The evil has been that persons have reasoned too hastily, even with regard to the fruit-trees themselves; probably Forsyth himself never made any accurate experiments for the purpose of ascertaining the absolute benefit to trees of his preparation, which was the progenitor of all that have been offered since his time.

As I have said, improvers do not merely scrape, they prune and manure at the same time, and by cultivation give the tree all it needs. Most triumphantly some defender of the other side will tear up the loose bark of the nearest tree, and show the cocoons and eggs beneath, and exultingly ask, now what have you to say? Simply that the eggs will be found to be those of the spider, or some other creature, harmless, at *least*, to the tree that protects them. Having thus shown that no insects, and no lichens, &c., injurious to the tree, are to be removed by the present process, whilst the tree is necessarily injured by the removal of nature's warm covering, we may proceed to our third division—beauty.

We are forced to confess that we are of those who believe *nature's taste best;* who do not believe that to strip the moss from the rose bud, or the gray and golden lichens from the tree's bark, is anything but *the most direct violation* of good taste. A continued study of the constituents of taste, or appreciation of the beautiful, has taught mankind that each perfect individual has a special beauty arising from its unity and speciality of constitution; men have learned, as the fruit of years' study, *that to entirely fulfill the conditions of being is a very chief beauty,* and that every effort to warp one individual into the sphere of another, results in a loss of some of the elements of perfection in the individual so transferred.

The tree scrapers, some of them, assume that smooth barked trees are more nearly perfect in their appearance and uses, than the rough; and that however much better the rough bark may serve the functions of the tree, the superior beauty of smoothness and uniformity will compensate for the deterioration of the active powers of vegetation.

But, as when the artist desires to produce a perfect statue, or painting, he *studies the best models,* so the tree growers should *seek*

out and admire nature's best efforts. The best elms grow in Connecticut river valley; the best maples in Vermont; the best oaks in the western oak openings; and the best ash in many of our New England States. How did these trees acquire their magnificence and beauty? There they stand in the meadows, with the grass close up to their stems, tall, stalwart, graceful, and magnificent; their sides are decked with lichens, and plowed with furrows; no more splendid specimens can be found in the world, and yet all they have had is fresh air, water, and a soil abounding in the necessary constituents for their growth. Here, then, is our standard; we do not wish to surpass—we shall be more than satisfied to equal them. No scraper ever profaned their sides, and no whitewash brush ever shamed their beauties.

Another argument, in addition to beauty, for the process is, that the rough and outside bark interferes with the necessary evaporation from the trunk. So far from hindering evaporation, there is none to hinder; in the young twig, seedling, or scion, there is an evaporation through the epidermis, as may be seen by cutting off a scion, and sealing its end, when in time it will shrivel; but as time passes, this epidermis is pushed out of the way by the new undergrowth, and loses all vitality, serving after that, so far as we know, only to protect the more tender parts from the bitter winds and burning sun. Probably these very unpopular furrows, as they extend down to the cambium, are the vehicle of any possible evaporation by the sides and bottoms. *If age has incapacitated* the rough bark trees, if they *are unable to live unassisted*, how much more blessed are the smooth-barked, the maple, linden, &c. See the fallacy and inconsistency of such reasoning. The maple, &c., having smooth bark, perform their functions healthfully in their age. All trees ought, therefore, to have smooth bark to perform their functions properly in old age. The elm, &c., have not smooth bark, and are consequently diseased, and must be cured with a three-cornered scraper and a strong arm. But, if trees were intended to have a rough bark, and it is removed, injury ought logically to follow, and it does; the tender bark below, through which the sap passes from the branches to the roots, is exposed; undue evaporation takes place, and ends in oxydation; this excessive evaporation is very injurious and weakening, and were the amount lost in that way to run from any one wound, the lesson would convince all. Many have dogmatized upon the necessity of cutting off branches smoothly, in order to allow the bark readily to heal over, and yet the very same men will gash and tear the bark of the same tree, to an unlimited extent, the ill effects of which may be seen by the newly wounded surface becoming brown, as does a green apple, when cut and exposed to the air. Such an exposure to wind and sun of the under bark, as has been made on the Boston Common elms, is ruinous, and, if persevered in, must destroy the trees.

How great the amount of evaporation would be made from the bark of a tree, no experiments have been made to prove; but as we know liquids will evaporate when in connection with the air, and any substance filled with water becomes dry in the sunlight, reason assures us that there can not fail to be a very large amount from so large a surface as the trunk of one of our stately forest trees, unless defended by the rough bark. And since no evaporation should take place, by fair rights, every ounce that passes off, after scraping, is a drain upon the energies of the tree.

It has been, therefore, so clearly shown, that there are no economical or scientific reasons for the present practice, and no need of any scraping, but at the worst mere rubbing and washing with soap, and as we can not suppose any man, whose opinion is desirable, is likely to think *the beauty of the tree increased by this practice*, we will spare you any elaborate discussion of the reasons why the beautiful tracery and combination of the lines, and the rare and harmonious combinations of colors, as exhibited in the lichens, surpass any other similar beauty in the vegetable kingdom, and we do, therefore, offer the following series of resolves to this Society, as the result of our investigation, and do urge this Society that they be published in such manner as is most likely to spread them widely before the horticultural world:—

That, whereas it is a common custom to scrape off the outside bark of fruit and ornamental trees, and wash and plaster them with lime and other preparations, in the hope of benefitting the trees by the destruction of parasites and insects injurious to vegetation, and of improving their general appearance, the Massachusetts Horticultural Society do hereby resolve, for reasons which have been stated, they consider this practice of no benefit to the tree *from its inability* to affect the majority of the *insects which are really injurious;* and unnecessary in the case of lichens and mosses, they being not *the cause, but the consequence of disease and decay;* and a positive violation of the laws of vegetable physiology, and consequently an injury to all trees, but ornamental in particular, to an *incalculable amount*.

Resolve 2d, That as lichens and mosses, in a healthy state of the tree, are, so far as can be ascertained, no injury to the bark, but, from their varied colors and forms, one of its chiefest ornaments, any operations for their removal are to be scrupulously avoided and reprehended.

Resolve 3d, That as strict inquiry has shown that bark-lice, woolly aphis, and some borers, do lay their eggs and hatch their young upon the bark of apples, pears, peaches, and maples, *near the ground, and in the forks of the branches*, a gentle rubbing with some pliable but stiff wire or other brush, on the parts affected, to be followed by a washing with weak, soft, or whale-oil soap-suds, is desirable and will be of benefit, when a careful examination shall have shown that the eggs are deposited upon any tree in question, *but that this process is unnecessary, and uneconomical when the presence of the enemy has not been most clearly proved.*

Resolve 4th, That nature is the best and only true guide in horticultural operations; and that if we wish to equal her in the health and beauty of our plantations, we must, as nearly as may be, follow in her footsteps; that as she provided some trees with rough, and some with smooth bark, there can be no doubt that the cortical differences have an intimate connection with, and relation to, the vitality and economies of the tree, and we view any separation of it from the tree, or any operations on its surface, having for their aim to reduce the rough bark to the smooth, or vice versa, *decidedly unscientific, and unworthy improved horticulture.*

Resolve 5th, That as it has been shown that fruit-trees are specially liable to be injured by a few insects, whose eggs may be removed by proper rubbing, it by *no means follows that all trees are to be subjected to the same treatment; that we would most strenuously discountenance any such universal medicinal practice;* that it must not be forgotten, in reasoning with regard to horticultural operations, that fruit-trees are sui generis, and being necessarily diseased, need much more care and attention than ornamental; and as we grow the one for fruit alone, and the most of it we can get, and the other for beauty and shade, so each needs a separate culture; and as one of the most delightful charms of the ornamental tree is this very roughness of bark, with its accompanying lichens, we consider *that man's taste unworthy and uncultivated, who can lay a rough hand upon the tree to reduce all to one unvarying uniformity.*

Resolve 6th, That as all bark is, from its composition, open to the attacks of alkaline preparations, and as no good and sufficient reasons can be adduced for their use, and as their caustic and cement-like nature tends to destroy the tissues, and prevent a proper expansion of the bark and stem, and as they are necessarily accompanied with considerable outlay, *we most sincerely hope the practice will cease.*

Resolve 7th, Although the subject of pruning has but little connection with bark culture, still, as they go hand in hand, they may not unreasonably be discussed at the same time; and whilst, for the *reasons above stated, fruit-trees need peculiar cultivation, and a certain amount of pruning*, ornamental require only to be *well planted and manured, and should never be touched by a pruner's hand further than to remove dead wood*, and we do regard with great sorrow and regret, all those efforts made by the ignorant *to trim away the beauty of the lower and hanging branches, reducing the tree, in too many cases, to a close resemblance* of a bunch of brush elevated on the top of a pole.

For the Committee,

R. MORRIS COPELAND.

ROXBURY, March 6, 1854.

By the publication of the accompanying Report, neither the Massachusetts Horticultural Society, nor the Committee, would wish to consider the practice of washing and scraping *fruit-trees* totally to be condemned, but hope that it will draw from the friends of horticulture any information that will throw new light upon the subject.

Any such information may be addressed to the undersigned, or to Dr. Eben Wight, Corresponding Secretary of the Horticultural Society. For the Committee,

R. MORRIS COPELAND.

A SINGULAR TREE.—Seven miles from Oregon City there is a species of evergreen tree, which abounds plentifully, of a character altogether peculiar. It is thus described:

The tree varies in hight from one to seven feet; the leaf resembles that of the pear, while the trunk and branches look like those of the orange-tree. The upper side of the leaf is thinly coated with a gum, having the appearance of oil, and of the consistency of honey. Handling them causes the gum to adhere slightly to the fingers. The gum, as well as the leaf and the bark, are highly odorous. The fragrance, which is quite strong, resembles that of bergamot, or ripe fruit, and a few leaves are sufficient to perfume a room. A leaf, fully wrapped up in a paper, so as to be entirely concealed, was handed to several persons, with a request that they would tell, by the smell, what it was. All expressed themselves highly delighted with its fragrance, but gave different answers as to its character. Some said it smelled like ripe pears; some said it was bergamot; while others thought it smelled like ripe apples. The flower resembles that of the white jessamine.

Remarks on Arboretums.

The attention of the reader who is planting in the country, is directed to this article upon the planting of trees, because it is believed that Mr. Paxton, in his *Botanical Magazine*, has presented a correct view of the case, and some of the planters of this country have manifested a disposition to pursue the Arboretum style of planting. How desirable soever it may be for the student of botany to find all the species of a genius collected together like a cabinet of curiosities, we should be careful to avoid errors of effect in landscape gardening, where success is so very dependent upon the whole scene.

It is the universal testimony of those who have bestowed any thought upon the workings and tendencies of the human mind, that the adoption of any extreme course of conduct always eventually leads to an attachment to the opposite extreme. And this has been frequently verified in the annals of horticulture. Many classes of plants, and modes of culture, which hold, for a time, a widely-spread sway over the votaries of the pursuit, almost invariably give way to a tribe or a system as different as possible from those before admired; while certain flowers which happen to be extremely fashionable at one period, are scarcely to be met with in the majority of places a few years afterward; whereas, perhaps, the lapse of a similar number of years may find them installed in public favor.

As a signal exemplification of the above principle, we have to advert to the recent history of exotic trees and shrubs. Without going further back than the beginning of the present century, we shall perceive that in very few collections the really worthless, or the more truly ornamental of the rarer kinds, were allowed a place. Common or second-rate gardens were generally decorated with masses of shrubbery, composed of ordinary species and varieties, and specimens of the finer sorts were seldom observable. Within a few years, a singular reaction has taken place. Instead of mixed groups, and solitary specimens, brought together or detached without any regard to their botanical relations, and solely with reference to their picturesque effect when viewed in connection with each other; it has become the fashion to collect *all* the known species of particular genera, or of every genus containing hardy, ligneous plants, and to place them in beds or masses, over a greater or less extent of surface, according to their systematic affinity. Such collections now bear the name of *Arboretums*.

The example of planting Arboretums having been set by several influential individuals and societies, and a strong inclination being manifested by others to follow out the same plan, it is important to show that what is in some cases laudable and desirable, may not be fit for general adoption, and, in fact, becomes absolutely disgusting when too often or improperly repeated. We will first examine the object of Arboretums, and see how far it is compatible with the great ends of landscape gardening.

To present, in an aggregated form, a view of all the trees and shrubs that can be cultivated in British gardens, so that their peculiar or relative natural beauties or singularities may be at once discovered; to afford the means of investigating the affinities and value of all classes of arboreous plants; in short, to establish a large experimental ground for determining the distinctness or identity, the tenderness or hardihood, the handsomeness or insignificance, of the woody tribes of vegetation, and at the same time insure as interesting a disposition and display as can be obtained, are what we conceive to be the purport of an Arboretum. That it is advisable and useful to familiarize the public with every variety of tree, and to ascertain decidedly its true character, will at once be admitted. Consequently, a national or suburban Arboretum must be extremely serviceable in many respects. How far the recreation furnished by such an establishment, or its influence on the minds and morals of visitors, falls short of what would be caused by a greater diversity of objects and arrangement, will be immediately obvious.

To create an Arboretum in a private garden, far other circumstances must be taken into account; and unless it be made quite a subordinate feature, and carried around the extreme outside of the pleasure-grounds, it will inevitably prove a palpable infringement on taste. To render it at all pleasing, it must be formed on a piece of ground of which the surface is exceedingly irregular,

the direction considerably varied, the sides composed of old plantations of trees, advancing and retreating in the greatest apparent disorder, and only one principal walk, having numerous and occasionally abrupt turns and windings passing through the center. If possible, all prepared hillocks and artificial plots should be avoided, and the spaces between and beneath the trees be sown with grass, which might be mown about once in three weeks. Every large tree that can be left standing with propriety, every practical deviation from order and system, and every opening that admits a view of the distant park or country, are to be assiduously sought, in order to relieve the necessary wearisomeness of artificial classification. And if a small stream can by any means be conducted through the department, or any portion of it, a lively alleviation of the prevailing sameness will be obtained.

All attempts at forming an Arboretum in a garden of limited extent, or flat surface, are sure to result in a displeasing and almost unbearable dullness, if a botanical arrangement is followed. It is only when the natural character of a plot is in itself beautiful, when every available assistance from art is employed, and the other divisions of the pleasure-grounds are immeasurably more extensive, that an Arboretum is at all tolerable.

One of the chief principles of landscape gardening, and one likewise which, being founded on a peculiarity of the mental constitution, is as lasting and immutable as the feeling on which it is based, is that the scene which, in the smallest compass, exhibits the most diversified aspect, conformable with congruity, is the most creditable to its designer, and productive of the largest amount of pleasure. Any arrangement, therefore, that associates plants solely on account of their generic alliance, and not because they are found by proximity mutually to augment each others beauty; or which introduces a quantity of species that have neither interest nor ornament to recommend them to notice, must, if wanting stronger arguments in its support, be decidedly repudiated.

The objectionable nature of Arboretums, except in places where there are unusual facilities for making them pleasing, have been before freely stated. We recur to the question here, as it involves a standing principle, the violation of which, in any egregious manner, will entail a durable disgrace on the horticulturists of the age.

Striking Cuttings in Water.

The following remarks have been communicated to us by an amateur experimentalist, upon the correctness of which reliance may be placed. Gardeners in general despise, or affect to despise, a mode of propagating a great variety of herbaceous and woody plants, which, however, (in instances too numerous to be detailed,) is eminently successful, and attended with circumstances highly interesting to the philosophic mind: this shall now be described.

It has long been known that *Nerium Oleander* will emit roots in water, provided the cutting be of a proper age, and the temperature of the water be raised to about seventy degrees, either by keeping the vessel in a warm room, exposed to the sun's rays, or by plunging it into a warm bed of leaves, tan, &c.; with such certainty is the end attained, that in this one instance regular gardeners comply with the practice, but there they stop. The idea suggested by the fact above stated, led to the following observations and results:

First, as concerns *Oleander*. The vessel in which the cutting is to be placed, should be a vial of white glass, with a neck, the orifice of which is at least three quarters of an inch, to permit the removal of the plant without much pressure on the newly-formed roots: this vessel should contain water sufficient to receive an inch or more of the lower extremity of the cutting, and the water should be kept to that quantity.

Second. The cutting ought to be of green wood, and taken off during the full growing season of spring and summer; for such cuttings, in water, succeed best, and never flag under the power of a hot sun. If winter or autumnal propagation be attempted, it will be better to adopt the ordinary method with mold or sand; and in either case it will be always worth while to take some of the cuttings, which show the germs of future blossoms; as it will not unfrequently happen that very pretty little plants may be formed, which will expand their blossoms in perfection with the first growth of the future wood.

This has been mentioned in a former article on *Nerium*.

Third. Though water be efficient in exciting radical developments, it will not support the plant for any considerable period; and it was proved, by direct experiment, that it was vain to expect any good result from the introduction of manuring substances into the fluid: even a little moss dropped into a vial containing a well-rooted healthy cutting, produced an almost immediate change. The roots lost their clear white color, became yellow, weak, and flaccid; and the plant perished in the course of little more than a week.

The foregoing observations will convey some idea of the general principles of water culture; but there are particular exceptions, which can not fail to attract the attention of any person of quick discernment. Thus, for instance, the beautiful *Erythrinæ*, (*Cristagalli*, and *Laurifolia*, the very young spring shoots of which will take root in water,) exhibit very interesting phenomena.

After remaining some days without any apparent change, a slight enlargement of the lower end of the cutting takes place, brilliantly white granulations of a species of cellular matter, closely resembling light pith of elder, form at and around the base, but do not adhere to it; many masses detach themselves, and fall to the bottom of the water, or, it may be, float in it; gradually, these masses increase, the bark cracks into longitudinal fissures, more parenchymatous substance emerges, and at length becomes truly organized; and then tubular and fibrous roots appear about the base, and at the fissures. The plants, when so prepared, may with safety be transferred to any light soil, than which none appears to be so extensively congenial as that pure *sandy heath-mold*, (not *peat* of the turbary,) which formerly was known by the term of *bog-earth*. Another example of water striking, is the *Dahlia*. The fact that the young shoots of the Dahlia would emit perfect roots in water, was elicited by an accident which may very easily befal any amateur who possesses merely a few roots of the plants. Some half dozen roots, which appeared in good condition at the commencement of the late spring, were placed on a little heap of loose earth, on the floor of a vinery, which was at work in forcing a set of vines in pots. It was thought that the gentle heat would stimulate the embryos sufficiently, and that the progress of growth could thus be daily observed. The experiment was not fully successful, and some shoots fell a sacrifice to slugs; so that it appeared most prudent, as the season was far advanced, to plant the roots at once into the open ground. Four of them produced good shoots, one was very weak, and the sixth was exhausted. To supply the loss, three cuttings of the strongest were taken off below the third or fourth joint, and put into the same bottle, which was placed on a shelf of the stove, close to a side light facing the south-west sun. During ten days, little change occurred, but at length the lower ends of each cutting enlarged, the bark opened in fissures much resembling those of a vine where aërial roots are protruded, pithy adhesive substance filled up each crack, and from this fibrous processes now emerge—for the experiment is at this moment in progress.

Balsams propagate freely in water, by cuttings of any size whatever; but in no vegetable production is the advantage to be derived from the process more evident than in the families of the melon tribe. Plants may be formed in a very short period, (sometimes in three days,) and being transferred to small pots of heath mold, will produce perfect balls of roots in less than a week.

In like manner, experience has shown that *Gloxinias*, and *Gesneria*, *Heliotropium*, *Peruvianum*, *Aloysia Citriodora*, *Petunia*, *Alonsoas*, *Salvias*, *Turnera trioniflora*, *Thunbergia*, *Melastoma cœrulea*, *Gardenia florida*, with many other stove and green-house plants, can be propagated. The season which heretofore has proved most favorable, is the hottest period of summer, *i. e.*, from the middle of June to the end of August. The practice is, however, still in its infancy; and thus a mere outline of its first principles can be traced. "But," says the professional man, "*cui bono*—to what does all this tend? Cuttings may, indeed, be converted into plants by the agency of pure rain-water, or that obtained from ponds, rivers, or deep wells, which last abounds with salts of lime; but they may be, and are, successfully treated in the ordinary routine of striking." True! this is admitted; but in that ordinary routine, numbers are lost; they do not take to

the soil, or damp off and perish, after having excited hopes of success for months; *and all the changes are produced—sub umbra—in the dark.* In water, if the plant succeed at all, it never droops; the operation is performed in a minute, and little anxiety results from the situation in which the vessel is placed. The progress of every development is discernible; and the operator contemplates with admiration the phenomena produced by the coëxistent decomposition and absorption of water, under the stimulus of solar light above, and radiated heat from beneath, when the vessel is plunged in a hot-bed.

The gardener becomes a philosopher; he sees before him proofs of vital action sustained in the first instance, and excited to produce new systems of life, by the agency of what appears a simple and lifeless fluid; he pauses, reflects, and then perceives that life pervades all nature. He becomes wise and humble; discerns, but still *knows* nothing.

Knowledge is proud, that it has learned so much,
Wisdom is humble, that it knows no more.

Pax. Bot. Mag.

Troup Hill Nurseries.—Peaches, &c.

I am fresh from a visit to the Troup Hill Nurseries, near Macon. I had not been on the grounds for three years, and was amazed at the contrast between *now* and *then*. I saw the feeble first beginning of the industrious, intelligent, skillful proprietor—and how much before him he had to accomplish, till he could secure a comfortable support for his family. A more unsuitable spot of earth—being a poor sand ridge—for nurseries, could not easily have been selected. But stripped of fortune in his native land, for entertaining liberal republican opinions, he was compelled to seek an asylum in America, and to apply all that had been left him, mind and muscles, in a direction which his knowledge enabled him readily to do, to horticulture, at such a place as his limited means would authorize. His beginning was such as might have been expected from one so reduced in property and position. I rejoice in his prosperity *now*, as evinced by the aspect of things around him. He has, unaided, except by the cheering voice and patronage of Mr. J. C. Plant, Doctors J. and H. K. Green, Geo. W. Fish, Esq., and a few other gentlemen, succeeded—and the broad and thoroughly-tilled acres of his nurseries, filled with the choicest varieties of healthy young fruit-trees, and shrubs, and flowers, known to the amateur; the rows all accurately labeled, attest that success. Much patronage as he has received in Georgia, Alabama, Florida, and Mississippi, he deserves *much more* at the hands of Georgians than he has had. His plants are acclimated, his accuracy may be relied on, his candor in dealing with you, in which he freely expresses his own judgment, can not be too much commended, and I will add, from my own experience, too much relied on by the purchaser; besides, his nurseries are accessible by railroads from almost every direction.

Indeed, I will add, if my testimony can benefit him, that, though with a pretty tolerable stock of general horticultural knowledge, the collection of a quarter of a century as an amateur, it has never been my good fortune to meet with any one who brings so much knowledge, science, and practical skill of his pursuit to assist him in his duties, as Mr. Nelson. I have never left his instructive conversation but with new and valuable ideas. Perhaps the most striking thing to me is, his *great good common sense*, and the ready facility with which he adapts his knowledge and skill to our climate and soils, instead of absurdly adhering, as most foreign-bred gardeners do, to European experience, rule, and culture.

There are, doubtlessly, other nurseries and nurserymen in Georgia, deserving notice, of whom I would readily speak and write, could I do so from my own observation; for I would not be invidious. All of them are benefactors of the State, all deserve patronage.

Of one of them, however, among the mountains of Habersham, not known to me personally, I am constrained to say, from every thing I have heard, that he is doing more for the enlargement of the apple culture, and the introduction of many new *native* varieties adapted to our climate, than any person amongst us. I allude, of course, to your very intelligent correspondent, Mr. Van Buren, of Clarksville. The climate and soil of that portion of our State above the parallel of Athens, is eminently adapted to the apple. I should be pleased to find the lands above that line employed in rearing large orchards of apple-trees, rather than cotton-stalks. I contemplate, with great satisfaction, the fact, that in a few years, here, and below, and westwardly, the supply of that fine fruit will be entirely from our mountain region, instead of from New Jersey, New York, and Massachusetts. The very best apples I have seen this winter on sale, were beautiful and high-flavored varieties from Hall county, greatly resembling the Spitzenbergs. Some articles published a few months since in our agricultural papers, have become a topic of conversation in social circles in which I have been, and I have been led, in consequence of some solicitation,

to express my views in reference to the same topic. That topic is the greater liability to loss of the peach crop, grown on trees from northern nurseries, than from our *seedling* peach-trees.

For something more than twenty years, I have been a limited customer of northern nurseries. I cultivate, indeed I think I have in my fruit garden, and with some scattering trees in my vegetable garden, about forty varieties, of the very best free-stone and clings known to me from reading or otherwise. I have never been able to perceive any superior hardihood of the native seedling, or a greater certainty for a crop from the latter than the former. When the northern tree gets acclimated, and this takes place in two to three years at most, it blooms at the same time with the native, and is not, therefore, more exposed to the dangers of frosts. If there is any truth in the idea of greater hardiness, I apprehend it will be found to exist in the larger size of the petals of the native flower; for it is worthy of being noted, that nearly all of the very best foreign varieties have small petals, whilst natives have almost always large ones. I can not, however, subscribe to the idea. My trees have uniformly borne good crops, except one year, when the frost destroyed every thing. I have suffered, I suffer every year, from peaches rotting; but this depends upon other and very different causes; principally upon the soil, and that terrible pest, the curculio. That this insect has been extending its ravages into the peach-orchard, (not content with the entire destruction of our apricots, plums, and nectarines,) will be easily determined by using a penknife in cutting up the fallen fruit, when you will almost always find the worm before he escapes into the earth to put on his new existence in a new form.

I think the opinion expressed by gentlemen who maintain the affirmative, is unauthorized by any *well-ascertained* general experience.

Unless that opinion is established *indisputably* by a course of experiments (easily to be made, and which should be regularly and accurately put down in writing at the time) I fear it may, if it make a lodgment on the public mind, do great mischief; or in other words, it may lead to the rejection of such peaches as Grasse, Mignonne, Noblesse, Norris' White Rareripe, George the 4th, Royal George, Robinson Crusoe, President Prince John, Owens' Great Unknown, Bullards' Freestone and Cling, Congress, Rodman's Red, Tippecanoe, Bayne's New Heath, Washington, New York Cling, Old Mixon, &c., &c., &c., from our gardens and orchards, and to the substitution of thousands of worthless seedlings, the fruit of which is better for distillation and fattening pigs than for the desert.

I wish not to be misunderstood as to seedlings. I would that every one would now *select* seeds of the peach, apple, pear, grape, &c.; and when the seedlings shall have been *thoroughly tested* by several successive crops, that the *good* only should be retained, and the remainder cut down and grafted with the new variety tested as above.

I, too, have some little experience in rearing seedlings. I now think myself very fortunate if I get *one* good kind out of every hundred, fresh from the nursery rows. Purchasers are easily duped by new varieties and fine descriptions. I fear that in times past, I innocently had some hand, in my enthusiasm of assisting a nurseryman at the North, in gulling purchasers.

Many years since, I purchased in the Philadelphia market a few superb plums; I brought the seed home and planted them carefully. One plant was characterized by extreme vigor and rapidity of growth. I felt very confident it would prove a first-rate seedling plum. I sent cuttings to my friend, the late Mr. James Camak, of Athens, as also to my friend Mr. Simri Rose, of Macon. They both propagated it; the former sent cuttings to a nurseryman who advertizes trees by the 100,000, and does every thing upon a big scale. I had the satisfaction of finding in that nurseryman's very full catalogue, about two years afterward, Harris' seedling plum, with size and flavor given, and highly commendatory remarks. Mr. Rose's experience was, that the variety would not bear; my tree, though very luxuriant, and flowering beautifully, *never bore a plum.*

I never heard from Mr. Camak a word about it. His experience must have been like Mr. Rose's and mine. The truth was discovered by us here—this seedling was deciduous. Yet by a transfer to a northern nursery, a great law of nature was overcome; it became a fine bearer, and its fruit highly flavored *in the catalogue*, but no where else.

Now who can not run out the consequences of my youthful enthusiasm in behalf of a promising seedling.

It is useless to deny the soft impeachment, I am a decided conservative, so far as good peaches are concerned. I intend to hold on to such as I have successfully tried, until I can of *native* origin get as good. If I mistake not, I am but expressing similar opinions to some I have read somewhere of a very distinguished horticulturist on the Mississippi, a Mr. M. W. Phillips.

I recently was informed that during the last year a distinguished nurseryman from Long Island, made a purchase of 500 Chromatilla Roses from the Troup Hill Nurseries. Also, that a considerable quantity of peaches from northern fruit-trees, was sent to New York city, Saratoga, and Boston, during the last summer, and commanded the highest (very high) prices, and unbounded admiration.

I was also informed from a reliable source, that a northern gentleman made application at Macon, to purchase of a person who supplies to some extent that market with one variety of peach, to purchase out his entire crop—to another to purchase five hundred bushels per week—for exportation to northern cities. *These are certainly interesting facts.*

What might not such men as our Peabodys, Nelsons, Van Burens, and others, by the side of the Central Railroad, from twenty to forty miles above Savannah, do, if assisted by the capital of some of our cotton planters, in producing strawberries and peaches for northern markets? They could be the Longworths, and Reybolds, and Pelhams, of the South, and with annual incomes of from $30,000 to $50,000. The cultivation of a few hundred acres in these fruits, teach our one-idea people that money may be made pleasantly and plentifully and quickly, otherwise than by cotton bags.

Au Revoir, IVERSON L. HARRIS.

The Geography of the Bread-Plants.

BY JOACHIM FREDERIC SCHOUW.

We call those bread-plants which contain in one or more parts of the structure a sufficient abundance of starch to furnish an essential article of food to man. The starch, or fecula, is that material which constitutes the principal mass of bread, although other substances usually occurring with it, gluten and vegetable albumen, play an important part in regard to nutrition in a stricter sense, especially to the formation of muscle.

Starch consists of whitish transparent granules, composed of thin layers, and of various forms and sizes, which lie inside the cells of plants, and are colored blue by a solution of iodine, while the membrane of the cell usually remain uncolored. In the potato, which has uncommonly large granules, they acquire a diameter of $\frac{1}{20}$ of a line.

The starch, or mealy substance, occurs sometimes in the *cotyledons*, that is, the leaf-like parts which enclose the germ before the seed is developed, for example, in beans, peas, nuts, walnuts, horse-chestnuts, &c.; sometimes in the *albuminous mass*, the part which encloses the entire germ, within the coats of the seed, for example, in the various kinds of grain, and the buckwheat; sometimes in the *envelope of the seed* (the fruit), for example, in the bread-fruit, the banana, the date, and the St. John's bread; sometimes in the interior of the *stem* (as sago), for example, in several palms, Cycads, and ferns; lastly, sometimes in *tubers*, which may be portions of the root or of subterraneous stems, for example, yams, cassava, salep, sweet potatoes, potatoes, Jerusalem artichokes, &c. Starchy matter does not occur in the leaves and flowers, at least not in such quantity as to be capable of affording a bread-stuff.

There are countries with such unfavorable climatal conditions, that they can not produce any bread-plant: among others, the North Polar lands. Here, dried fish principally takes the place of bread, and, combined with fresh fish and marine mammals, constitutes almost the sole food. We can imagine a line separating these regions from the bread countries, and this line may be called the *Bread-line.* This does not by any means run parallel with the circles of latitude, but makes considerable curves toward the pole and equator.

The *Bread-line* extends furthest north in Scandinavia, for in Finmark we meet, only within the fiords, it is true, with barley and potatoes up to 70° N. L.; from here it sinks both to the east and west. It is well known that neither Iceland nor Greenland possess bread-plants, although the south coast of the former lies in 63½°, and that of the latter in 60°, N. L.; and that in the Feroë Islands, although lying between 61½° and 62½°, there exists but an inconsiderable cultivation of barley. On the east side of North America, the Bread-line sinks still further to the south, for Newfoundland and Labrador have no bread-plants, and the limit can scarcely be put here higher than 50°, consequently much further south than in Denmark, where the plains abound in corn. It extends a little further north on the western coast of North America, which, as is well known, possesses a warmer climate than the east side; the few data which we find here, render the determination of the north limit rather uncertain; it can scarcely be placed higher than 57° or 58°. Turning from Scandinavia toward the east, we find a depression of the Bread-line, even in European Russia, here coming by 67° northward of Archangel; the curve is considerable in Asiatic Russia—at Ob the north limit of bread comes to 60°, at Jenesei to 58°, at Lena 57½°, and in Kamtschatka, which has only a slight cultivation of corn in the most southern part, it sinks to 51°, thus about to the same latitude as on the east coast of North America. The Bread-line has thus two polar and two equatorial curves, the former corresponding to the western, the latter to the eastern sides of the continents. Toward the south pole, there exists so little land, and this is so sparingly cultivated, that the Bread-line can not be drawn with certainty there. Every thing indicates that the curvatures are much slighter.

The portion of the solid surface of the globe which lies within the bread-limits, may be divided into several zones, according to the *prevailing* bread-plant, but it is better to define them separately for the different longitudinal zones.

In the western part of the old world (Europe and Africa), we can distinguish six zones, succeeding one another from north to south; but it must be observed here that these limits are by no means so sharply defined in nature as on the map, and that the predominant bread-plant of one zone occurs frequently also, although subordinate, in the others.

1. *The Zone of Barley, Oats,* and the potato, includes that part of Scandinavia which borders on the Bread-line; that is to say, Finmark, Nordland, and the higher districts of the Scandinavian mountains, the Feroë Islands, the Shetlands, the most northern part of Scotland and Ireland. Bread is made of barley or oats, or of a mixture of the two; potatoes constitute an important food. The north and south limits of this zone may be determined according to the varying distances from the sea.

North boundary, 62°—70°—67° N. L.
South boundary, 57°—65°—60° N. L.

2. *The Zone of Rye* occupies the greater part of Europe north of the Alps, but with the exception of the west side, for in England and France wheat is the predominant breadstuff, and the zone of wheat thus immediately adjoins here that of barley and oats. In the zone of rye, buckwheat, beans, and peas, are also important farinaceous food; in the east, moreover, millet is considerably used. The cultivation of wheat and the use of wheaten bread increases in this zone as we proceed southward. The boundaries of the Zone of Rye may be placed at the east side of Europe, at about,

North boundary, 65°—60° N. L.
South boundary, 50°—48° N. L.

It must be observed, however, that the Zone of Rye is found in the center of Europe, and southward of 50°, on account of the elevation of the countries. Barley is chiefly used for beer in this zone, which is destitute of the vine; oats are used for the food of horses.

3. *The Zone of Wheat* extends from the above-mentioned boundary of the Zone of Rye (in the west, of the Barley and Oats Zone) to the African desert; consequently, from west to east in Europe and the north of Africa.

North boundary, 57°—50°—48° N. L.
South boundary, 30° N. L.

This zone, therefore, includes, besides Great Britain and France, the whole of Southern Europe and the north of Africa. In this zone, in the middle of the northern boundary (50°), maize already plays a not unimportant part, and from 45° rice also; but they are usually confined to certain regions, and subordinate to the wheat. Beans, lentils, and several pulses, as well as millet, and, in some districts, (especially Egypt,) durra, are of some importance as articles of food. Barley is not used for beer here, but chiefly for the food of horses and mules. In the mountain regions of this zone, rye sometimes appears predominant; in some parts chestnuts form the principal farinaceous food.

4. *The Zone of the Date* adjoins the African deserts between 30° and 15° N. L. The greater part is destitute of bread-plants; dates, however, constitute the principal food in the oases. But wheat and several other kinds of grain are also cultivated here.

North boundary, 30° N. L.
South boundary, 15° N. L.

5. *The Tropical Zone.*—Rice and maize are the grains chiefly used here, but other bread-plants play an important part, especially yams, mandioc, (cassava,) and the plantain. It includes both the west and east coasts of Africa, from the deserts to the southern tropic; the interior is little known, but so far as it is, the same appears to hold good, excepting in the case of Abyssinia, where the conditions are somewhat altered, on account of the elevation.

North boundary, 15° N. L.
South boundary, 23° S. L.

6. *The Southern Zone of Wheat.*—In the south of Africa, especially in the Cape Colony, the European grains again make their appearance; wheat is predominant.

North boundary, 23° S. L.
South boundary, 35° S. L.

For the *eastern portion of the Old World,* (Asia,) as well as for *New Holland,* the following zones may be laid down, but they are greatly modified by the great Asiatic mountain regions.

1. *The Zone of Barley, Oats, and Rye,* which goes from the Bread-line to about 50° in the west, and to 40° in the east of Asia. Besides the grains named, buckwheat and potatoes, especially the former, are cultivated to a considerable extent.

North boundary, 60°—51° N. L.
South boundary, 50°—40° N. L.

2. *The Zone of Wheat in the west, and Rice in the east.*—In the west of Asia, between 50° N. L. and the tropic, wheat prevails. In the east, on the other hand, the cultivation of rice extends to the south limit of the preceding zone; wheat, indeed, occurs also, but not in sufficient extent to form a zone. In the middle of the continent there is but little agriculture in the dry and sterile plateaux and mountains. The limits, therefore, are:

	The Zone of Wheat.	The Zone of Rice.
North boundary,	50°.	40° N. L.
South boundary,	23° N. L.	

3. *The Tropical Zone.*—The predominant bread-stuff is rice; but the yam, plantain, and cocoa-nut, also, bear an important share; and with regard to the Archipelago between Asia and New Holland, (Polynesia,) the sago-plants, the bread-fruit tree, and the cocoa-nut palm, divide the predominance with rice.

North boundary, 23° N. L.
South boundary, 23° S. L.

4. *The Southern Zone of Wheat* occurs only in the European colonies, in New Holland and Van Dieman's Land, where, also, the other European grains are cultivated.

North boundary, 23° S. L.
South boundary, 44° S. L.

For the *Islands of the South Sea* (Oceania).

1. *The Zone of the Bread-fruit and Cocoa-nut Palm* includes the islands within the tropics. Taro (*Colocasia esculenta*) is also general here.

North boundary, 23° N. L.
South boundary, 23° S. L.

2. The inhabitants of *New Zealand* have hitherto used only *Fern-stems* as sources of farinaceous food.

North boundary, 34° S. L.
South boundary, 48° S. L.

In regard to *America*, the zones may be found in the following manner:

1. *The Zone of Rye, Barley, and Oats*, as well as Potatoes. No special zone of Rye can be distinguished here.

	Western.	Eastern.
North boundary,	58°.	50° N. L.
South boundary,	50°.	45° N. L.

2. *The Zone of Wheat.*—Although, taken altogether, wheat predominates here, maize occurs very frequently from 45°, and in Carolina, rice even takes the place of wheat.

North boundary, 50°—45° N. L.
South boundary, 30° N. L.

3. *The Tropical Zone.*—The predominant grain is maize, but the yam, sweet potato, cassava, and plantain, play a very important part, to which may be added arrow-root, (*Maranta arundinacea*,) chayote, (*Sechium edule*,) &c.; in Brazil, rice is universal.

North boundary, 30° N. L.
South boundary, 23° S. L.

4. *The Southern Zone of Wheat and other European grains.*

North boundary, 23° S. L.
South boundary, 45° S. L.

The difference of geographical latitude is not the only means of establishing boundary-lines and zones for the bread-plants; the elevation above the sea is another agent, and in some cases in the warmer countries those zones which the latitude gives, change according to the elevation.

In the center, and partially in the south of Europe, the zone of wheat is resolved at a certain hight into that of rye, barley, and oats, and the last-named grains also disappear at a greater elevation.

On the Himalayas, the cultivation of rice extends to a hight of about 3000 feet, it then gives place to wheat, which forms a zone between 3000 and 10,000 feet; higher up, between 10,000 and 12,000 or 13,000 feet, barley and oats are still grown. Barley attains this great elevation, especially on the north side, in Thibet.

In the tropical regions of America, the zone of the plantain and Mandioc, extends to 3000 feet, of maize to 6000 feet. After these, wheat and the other grains form a zone between 6000 or 9000 feet; in the upper part of Peru these grains extend even to 10,000 feet, and particular places to 12,000 or 13,000 feet. In Peru and Mexico, potatoes are cultivated up to 10,000 feet; and in Peru, quinoa, to a still greater elevation above the sea.

If we wish to reduce the most important bread-plants into two principal classes, *tropical* and *extra-tropical*, the first class must contain the rice, plantain, yam, sweet potato, chayote, arrow-root, cassava, bread-fruit, sago, cocoa-nut, taro, and date; the second will include wheat, rye, barley, oats, buckwheat, and potatoes; maize is common to both. In regard to frequent occurrence, and to the number of human beings which the various bread-plants support, the rice, among the grains, undoubtedly holds the first rank; then follow wheat and maize, and lastly, rye, barley, and oats. Among the other bread-plants, the plantain, yam, bread-fruit, and potato, play the most important part.

The bread-plants exhibit a great difference in respect to fruitfulness.

A comparison even of the different kinds of grain shows that the tropical yield more nourishment than the extra-tropical. While wheat yields on an average five or six fold in Northern Europe, and eight or ten-fold in Southern Europe, and the rest of the European grains about in the same proportion, maize yields in temperate climates eighty or a hundred fold, in the torrid zone three or four hundred fold, and rice a hundred fold. But the yield is more variable in these two grains than in the former; if drought ensues, the maize fails, and if the rainy season does not make its appearance, the rice is ruined. Hence great famine is frequent in India and China, especially since rice is so often the sole food in these regions.

The plantain yields 133 times as much food as wheat on the same area. Hence a small garden around the native's hut is sufficient to feed a family. Within a year after

it is planted it bears ripe fruit; if the stem is then cut off, new ones spring forth, which bear in three months.

A cocoa-nut tree yields, on an average, thirty nuts a year, which is a considerable product, when we take into consideration the size of the nuts and the abundance of nutritious substance. The bread-fruit tree yields fresh fruit for eight or nine months of the year; during the rest of the time, bread, baked from the fruits, prepared like dough, is eaten; it is estimated that three trees are sufficient to feed one human being. Cook expressed himself in the following terms: "If an inhabitant of the South Sea has planted ten bread-fruit trees during his life, he has fulfilled his duty toward his family as completely as a farmer among us, who has every year plowed and sown, reaped and threshed; nay, he has not only provided bread for his own lifetime, but left his children a capital in the trees."

It is still easier to provide bread in the eastern islands of the Asiatic Archipelago, where sago grows wild in the woods. When the native has satisfied himself, by boring a hole in the trunk, that the pith is ripe, the trunk is cut down and divided into several pieces, the pith is scraped out, mixed with water, and strained, and there is sago-meal perfectly ready for use. A tree commonly yields 300 pounds, and may afford 500 pounds or 600 pounds. Thus a man goes into the woods and cuts his bread, as we hew our firewood.

But the facility for obtaining bread seems to stand in inverse proportion to civilization. Other causes certainly exist, especially the differences of national character, determining the degree of civilization in most of those regions where nature is so bountiful; but the superabundance of nature herself undoubtedly contributes to lessen the energy of man. Strife against nature, when not too hard, advances civilization. Labor is the mother of enlightenment. History has not preserved the record of those who first used the bread-plants, who first planted them; for history could not come into existence until mankind had satisfied the first necessities. The early history of the bread-plants is enveloped in obscurity, in the form of traditions and myths, according to which the gods themselves descended on to the earth to confer the great gift upon mankind. In India it was Brahma; in Egypt, Isis; in Greece, Demeter; in Italy, Ceres, who gave corn to the natives, and taught them to cultivate it. The ancient Peruvians had similar traditions respecting maize; and so late as the advent of the Europeans, this grain, native to America, was cultivated round the Temple of the Sun, at a great elevation above the sea; and the grain was distributed among the people, who believed thereby to ensure a fortunate harvest.

It is a remarkable fact, that we are still in uncertainty whether the different kinds of grain still grow wild in the old world, and if so, in what region this occurs. Even the authors of antiquity were at variance as to whence wheat and barley, the chiefly-used grain at that time, had been derived, and in the various statements less regard seems to have been paid to actual facts, than to the fertility of the countries, and the desire to secure for the native land of the writer the honor of having furnished so great a gift to mankind. The same uncertainty still prevails respecting these two kinds of grain, and the same is true of oats and rye. It was supposed that the rye had been found wild upon the Caucasus, but later observations have shown that this wild plant is different from the cultivated, particularly in having the central stem of the ear so brittle that it can not be threshed. A wild rye is also found in Sicily, but this too has characteristics by which it differs from the cultivated kind. When plants are met with, in a wild condition, exactly like our kinds of grain, it is usually in places which have been cultivated at a former period, and thence it is probable that they are only outcasts, and not wild aborigines. Thus we do not know whether the parent plants of our northern grains have totally vanished, or have become so altered by cultivation, in the course of time, that we can not recognize them in the species to which they actually do owe their origin. The same seems to hold of maize in America. This grain was already diffused over South and North America when the New World was discovered, and the statements which have recently been made respecting its occurrence as a wild plant, in Paraguay, for instance, leave the same doubt as to whether it is not merely an outcast from cultivation, which we meet with in respect to the grains of the Old World. Rice seems, indeed, to have its home in India; whether, however, the statement of the Danish missionary, Klein, that he has found it wild there, is sufficient testimony, for similar reasons remains doubtful. Most of the accounts which we had of potatoes growing wild in Chili, Peru, and Mexico, have since proved to be unfounded, for it has been discovered that these referred to other species of the numerous genus to which the potato belongs.

On the other hand, the date-palm grows wild in Africa and Arabia; the cocoa-nut in India, Ceylon, and the whole of Polynesia and Oceania; the sago-palm in the East Indian Archipelago; but all these occur in a more confined region of distribution than is occupied by the plants as now cultivated. The bread-fruit tree, which occurs in the Indian Archipelago, and the buckwheat, which is found wild in Siberia, near the Chinese border, may also be included among

the bread-plants, which are known to occur still in a wild condition. The most important bread-plants of the present and past might be represented on different maps, just as we have maps of ancient and modern geography. Comparisons of them would show the migrations of the bread-plants, and interchange of them between the various countries and quarters of the globe.

In the *countries of the Mediterranean* (Italy, Greece, Northern Africa, and Western Asia) *wheat* and *barley* were, in antiquity, the ordinary, very widely-diffused grains. We find mention of them in the oldest writings, in the Bible, and by Homer, and Herodotus; we find representations of them in monuments of the earliest times. Millet was also known then, but played then, as now, a subordinate part. They had not rice at that time; it was known only as an Indian plant; the American grain, maize, was of course unknown at that time; of rye (which even now is little cultivated there) no certain traces found.

Central and Northern Europe had very little corn-culture at that time; and in the same way as *barley* and *oats* now furnish bread in the northernmost parts of Scandinavia and Scotland, according to Pliny, the ancient Germans lived upon oat-groats; the inhabitants of the north probably possessed no better bread-stuff. Rye seems to have come into Northern Europe at the time of the migration of races from the Caucasian countries, without having entered the lands of the Mediterranean; and wheat appears to have migrated at a later period from the south to the north of Europe, chiefly by the way of France.

In *Africa*, south of Atlas, the date-palm prevailed then, as it does now. *Durra*, which is now extensively diffused in North Africa, has been derived either from Nubia or Western Asia.

India, as we see from the writings of antiquity, had then, as now, *rice* for the principal article of food; the plantain grew there likewise, probably also the yam.

It must be assumed that *sago* grew then in the *Indian Archipelago*, since it occurs wild there at present.

Before the discovery of *America*, the principal material for bread in this part of the globe was *maize*, also *cassava*, possibly *yams*, (a different species from the Indian,) and *potatoes* and *quinoa* upon the mountains. The vast national migrations from Asia toward Europe, which took place in the middle ages, appeared to have merely caused one change: the penetration of rye into Northern Europe, and its gradual displacement of the oat.

The great conquests of the Arabs in North Africa, Spain, Sicily, and other lands of the Mediterranean, brought rice from India, first to Egypt, and afterward to the south of Europe; they brought also the plantain from India to Western Asia, Egypt, and Barbary; by them was the durra, or, as they called it, the Moorish millet, diffused over the countries of the Mediterranean, especially North Africa and Portugal.

The discovery of the road to India, southward of Africa, caused a far greater revolution, but above all, the discovery of America.

Maize was introduced from America, and became diffused with extraordinary rapidity over all the Mediterranean countries, some parts of Central Europe, nay, it even found its way to China and Japan, and into the interior of Africa. The potato became known much more slowly through Northern Europe and Northern Asia. Cassava was brought from America to the tropical regions of Africa and Asia.

In return for these great gifts, America obtained the supposed European grains, which the colonists diffused and continue to diffuse in North America, the temperate parts of South America, and over those elevated regions within the tropics which have a temperate climate.

Brazil, Carolina, and other regions, thus obtained rice, which at present constitutes so important an article of cultivation there. America also acquired the plantain; some, however, believe that one species of plantain is a native of America.

The European colonists also conveyed wheat and other European grains to the Cape Colony, and, after the colonization of New Holland and Van Dieman's Land, to the temperate regions there.

In respect to changes on a smaller scale, it is remarkable how rye has been gradually displaced by wheat in the north of Europe, just as at an earlier period the former displaced oats. In the period 1651-1675, the wheat exported from Dantsic bore to the rye which was exported thence, the proportion of one to three; in the period 1801-1825, the proportion was exactly reversed, namely, three to one. In the year 1758, it was calculated that not quite two-thirds of the population of England and Wales lived upon wheat; the rest upon rye, barley, and oats. At present not one-eighth live upon the last. In the year 1727, a small wheat-field near Edinburgh was regarded as a rarity in Scotland; since 1780, the product of wheat in Scotland has increased tenfold. At that time wheaten bread was seen only at the tables of the richer classes; at present, not only on that of the middle classes, but that of poorer people of the towns, and, in fact, of the country. In Denmark, also, the cultivation and the use of wheat has increased; and, indeed, a time may come, when the use of rye, and that of wheat, will stand in a totally different proportion from the present; nay, it is even probable that Denmark will, at a remote

future period, pass from the zone of rye into that of wheat.

It would be interesting to have a complete summary of the *production of bread-plants*, and of the *trade* carried on with them; but from want of sufficient statistical data, I must confine myself to a few *observations* respecting the *production* of, and trade in corn.

While in antiquity, Sicily and Barbary were the great granaries, these must now be chiefly sought in Northern Europe.

The plains lying to the south and south-east of the Baltic, are especially adapted for the cultivation of grain, by the constitution of the soil, and the comparatively warm and dry summer. Hence the most important granaries for a great portion of Europe are here. One of the most important cities on the Baltic for the export of corn, is Dantzic. Lying at the mouth of the Weichsel, which, with its tributaries, especially the Berg, flows through fertile corn-plains, the city receives the grain by water communication, in flat-bottomed boats. According to an average of twenty-five years, 1801-1825, 535,000 tons—namely, 400,000 tons of wheat, and 135,000 tons of rye—were exported annually; but in the three years, 1829-1831, 559,000 tons of wheat, and 117,000 tons of rye, making together 676,000 tons. In particular years, when the conjunctures were faverable, especially when the English corn-market was open, the export of corn has amounted to 1,000,000 tons.

The other important points for the export of grain, on the Baltic, are Memel, Königsberg, Stettin, Riga, and St. Petersburg.

According to an average of six years, (1830 and 1836-1840,) the total export of corn from Russia amounts to 4,500,000 tons; if we deduct from this about half a million for Archangel, one million for Odessa, and half a million for the other export towns on the Black Sea, the export from Riga and St. Petersburg amounts to about 2,500,000 tons. The export from Königsberg, Memel, Stettin, and Rostock, I do not know accurately, but they may be set at 1,000,000, or 1,500,000 tons. Consequently 4,000,000, or 4,500,000 tons are exported from the countries on the south and south-east of the Baltic. Although Archangel lies in the White Sea, and near to the northern boundary of the cultivation of corn, it has still a considerable export, which amounted to 400,000, tons, according to an average of the years 1827-1832. The river Dwina connects this city with a large tract of country rich in grain. Here, however, as might be expected, the export consists almost wholly of rye and oats.

The export of corn from Denmark is very considerable. According to statistical tables, the average of twenty years (1820-1839) gives a surplus of 1,354,803 tons, exported from the entire kingdom of Denmark; in the year 1839, the surplus amounted even to 1,850,357 tons. The export of corn in ground and baked condition has increased of late years; in the four years, 1820-1823, only 3,406 tons of wheat flour were exported, and no bread; in the four years, 1836-1839, on the contrary, 62,646 tons of wheat-flour, and 38,271 of bread.

The export from the ports of the Baltic, from Archangel, and from Denmark, provide for the deficiency of grain in the Scandinavian peninsula, especially in Norway. A portion goes to England, some to Holland, Belgium, and France, some even to South America.

The second great granary of Europe lies in the south-west of Russia, which is inclined toward the Black Sea, and traversed by the rivers Dnieper and Dniester; in particular, Volhynia and the formerly Polish provinces. Odessa is the most important place of export for this great production of grain; on an average, more than a million tons of wheat are annually exported; but only a small quantity of other kinds of grain. The wheat of the Black Sea goes to Turkey, Greece, Italy, and Spain, and moreover to England also.

A third corn country of importance is Egypt, whence wheat is in like manner conveyed chiefly to the ports of Southern Europe.

Those portions of North America which lie within the corn-limits, also export grain. Canada sends wheat to England; the United States of North America export wheat and maize, principally in the shape of flour, especially to the West Indies and South America, the most important places of export being New York, Philadelphia, New Orleans, and Baltimore. Carolina furnishes much rice to Europe and South America.

Brazil exports rice; and Southern Chili, as also the Cape Colonies, wheat.

In several countries the false politico-economical dogmas, as regards the corn-trade, have been gradually discarded, according to which it was considered advisable sometimes to forbid the export of grain, sometimes to allow it, and to alter the tax upon foreign corn according to circumstances. Political economists have drawn attention to the evils of that system. Manufacturers, and other industrial classes, were compelled to pay an extravagant price for the first necessaries of life; the sale of manufactured goods and colonial wares was diminished, because foreign agricultural nations were not allowed to give their corn in exchange; and through the great instability of the corn-trade which necessarily resulted from the system, both the provision for the country was rendered less secure, and the price of foreign corn raised much higher than it would be under a steady market, on which producers and merchants could calculate.

The Tulip.

There is discoverable lately, on the part of gardeners and amateurs, an evident tendency to neglect the tulip; once the most favored and costly flower of the garden. Few, indeed, cultivate them at all; and it is, perhaps, difficult now to appreciate the high value once set by florists on their showy and brilliant blossoms. Two hundred years ago, tulips were the objects of a remarkable and unexampled traffic. They were largely cultivated by the Flemish and Dutch, and were sought after by all classes; princes and nobles, gardeners and peasants, everybody, coveted them, with an eagerness and avidity that has no parallel in modern favoritism. Merchants forsook their warehouses, tradesmen their shops, artists their studios, all their previous fancies, to engage in the cultivation of tulips. The spirit of competition and rivalry took complete possession of the people, and well-nigh absorbed all other interests. Tulips ranked in value with diamonds and other precious jewels; and the producer of a new variety, a new color or stripe, was at once the honor and envy of his neighbors, as different tones of rivalry and emulation prevailed. The possession of a few square feet of tulips, was a fund of wealth, scarcely surpassed by a Californian gold-placer. Respectable fortunes, indeed, were cheerfully exchanged for a few simple bulbs; and single flowers were sold like costly ornaments of gold and gems. A thousand dollars was not regarded as too exorbitant a price for a single plant; and a solitary cut flower frequently brought an hundred. Twelve acres of good land were once given for one bulb; and we still have the record of the transaction between two Holland amateurs, in which, for a single plant, one gave the other thirty-six bushels of wheat, seventy bushels of rice, four oxen, twelve sheep, eight pigs, two hogsheads of wine, four hogsheads of beer, two barrels of butter, one thousand pounds of cheese, a bed, several articles of wearing apparel, and a silver cup; and the account adds, that the farmer made a good speculation.

But these prosperous days of the tulip have passed away, and the once admired and exalted flower has fallen into neglect and decay. Occasional patches of them are seen beautifying some of our rural gardens, but the instances are rare, and the flowers few. Yet still the tulip is beautiful; still its bright satiny cups, of carmine and gold, and rose and purple, and white and vermilion, has its friends and patrons, who, if not so enthusiastic as the amateurs of old, have nevertheless an appreciative admiration of its really deserving and fine qualities. It would be well if some of our gardeners would renew attention to this plant. It is of easy cultivation, and multiplies rapidly. There have been catalogued over a thousand well-marked and constant varieties of them. A list of about seven hundred approved kinds is in the hands of the writer. Indeed, it has been said, that in beds presenting the bewildering display of two thousand dazzling blooms, no two were alike. Five hundred thousand tulips, of every imaginable shade of color, and variety of markings, may be seen in bloom at one time, in the garden of the Grand Vizier at Constantinople. This must be a scene of unmatched splendor; especially at night, when the garden of his excellency is illuminated by thousands of lamps; the whole enlivened by the varied plumage, and wild music of vast numbers of singing birds.

We repeat our hope that the tulip will come again into favor, and shall offer, in a future number, some remarks upon its culture, and the production of new varieties. They are peculiarly garden flowers. Their brilliant colors, their durability, and size, render them especially adapted for the adornment of the open ground; in which, with very little care, they will, by proper arrangement of sorts, display their gay beauty for a period of some ten weeks, from March to June. They are not adapted for bouquets, and they will, therefore, generally be left to live out the full period of their blooming, which may be prolonged for each individual, from ten to fifteen days. The accidents of disease, rains, and storms, are of course likely, more or less, to shorten this period, but they last in bloom longer than most flowers. Nothing can be more attractive and pleasing than a large bed of well assorted tulips.

J. W. W.

Floral Periods.

The varying times of flowering of different vegetables, present many interesting phenomena worthy of general attention. We have published several tables of the opening of many of our native plants, but they must be regarded as instances, and scarcely as established laws. The plants named in these lists are those, the opening of which in the month named, have been really observed. In some seasons they may open earlier, in some later. In our uncertain and capricious climate, no days or periods of days can be given as the uniform and invariable time at which any given number of our native plants shall be found in bloom. These periods vary in different years as much as three weeks, and possibly, in some unusual seasons, more. The peach has been observed to bloom one spring quite three weeks earlier than it did the previous spring. And so of the buckeye and maple. No certain dates can be established for their flowering. But there is another class of phenomena connected with the blooming of plants. I mean the diversities presented by the different ages of plants with reference to their epochs of flowering. Some bloom in one year, some in two, some not till several years after growth from the seed, and others in a few weeks or months; of which last, some have a biennial, some a polennial, and some only a semi-annual existence. There are truly annual plants, but the term is frequently misapplied. A plant that springs from the seed in May, attains its growth in a few weeks, and blooms, perfects its fruit, and dies in September or October, is certainly not an annual, if the term has reference to duration of life. Many plants called biennial are, strictly speaking, only annuals; that is, a year completes the period of their life. They appear in the spring of one year, grow vigorously through the summer, survive the winter beneath the ground, and come forth the succeeding spring to bloom and fruit at an early period, and die. The cruciferæ afford familiar examples of this truly annual life. Most of our so-called annuals, however, have, really, only a semi-annual existence.

Of perennial plants, some come into bloom the first year of growth, or within the first six months of their age; some the second year of growth, or within the first year of their age, (or nearly so); while others remain without bloom till the second, third, and even more advanced years of their age. Having once bloomed, the greater part of them continue to flower annually, until the termination of their lives; and of these again, may be distinguished, those that have a limited period of florescence, occurring but once during the year, and those that are in flower through the entire summer. The various circumstances of season, position, soil, etc., may hasten or retard the flowering periods, as already hinted; and, in many instances, entire and apparently permanent changes in habit are produced by removal, and a change of climate and the conditions of soil, moisture, and position. Thus, many plants whose florescence is annual in warm climates, become biennial when removed to more northern latitudes. The nature of the soil has a marked influence on the phenomena of florescence. A plant, native to a light sandy ground, is subject to a more or less complete suppression of bloom, by a removal to a compact clay soil; a fact full of suggestive interest to the cultivator. It is known, also, that a soil very rich and decomposed, will develop a luxuriant growth of leaves at the expense of flowers and fruit; while a thin, sandy soil is often conducive to a rapid and abundant florescence.

As a general natural law, it may be stated that the period of bloom, with relation to the season of the year, is, with each species of plants, uniform and determined. That is, any plant, in its native habitat, and under constant climatal phenomena, will expand its blossoms at the same time of month, possibly to a day, year after year of its life. In a broader sense, even in variable climates, all plants have their flowering seasons, as in spring, summer, autumn, etc., and may be generally distributed into classes corresponding with these periods. It was on this principle that Linnæus constructed his "Floral Calendar." But the influence of heat and cold, as modified by the familiar variations of the seasons, tends to hasten or retard the flowering periods, and renders any comprehensive arrangement of this kind only probable and proximate. It has been regarded as an interesting inquiry, in this connection, to ascertain the amount of heat necessary

to florescence, comparing one group of plants with another. Thus the white poplar blossoms at a low temperature; by which is meant, that it requires, comparatively, a small degree of accumulated or absorbed heat to insure its blooming. The vine, it has been said by the careful experimenter, Mr. Adanson, requires more than ten times the amount of heat demanded by the poplar, while the lilac is satisfied with half the amount required by the vine. The subject is interesting, and worthy of experimental investigation. The influence of heat upon floral development is exemplified by the numerous familiar instances of plants of the same species, differently situated as to exposure and protection, coming into bloom at different periods. A peach will be in fruit sooner or later than another of the same kind, according to its position with regard to the solar heat, and the northern winds. No plant is independent of these influences; and the suggestion is good and practicable, that to save fruit-trees from the injurious effects of spring frosts, their expansion and bloom must be retarded by protection from the accelerating influence, not only of the solar rays, but equally of the radiated and reflected heat from walls, banks, and hill-sides.

There are interesting points of observation touching the flowers themselves. Their phenomenal history is quite diversified. Some open before daylight in the morning; as the convolvulus, day-lily, etc. Some not till after sunrise; as the Cape Marigold, red pimpernel, etc. Some expand at noon; as the ice-plant, star-of-Bethlehem, etc. Some in the afternoon; as the Telinum, four-o'clock, etc. Some at sunset; as some of the poppies, the evening-star, the primrose, etc. Some open at night; as a species of Jessamine, the cypress, cereus, etc. Some flowers open at a certain fixed hour, and remain open a determined period; the cistus opens at half past ten o'clock, and closes uniformly, it is said, at three—some observers say, with confidence, at quarter past three. Tragopogon pratensis, and porrifoliuss close their flowers at twelve. The garden lettuce opens at seven and closes at ten o'clock in the morning. The cistus grandiflora opens at about seven in the evening and closes before morning. Some flowers do not open again having once closed; others reëxpand their petals once, twice, and even a greater number of times; the ornithogalum umbellata expands and closes several days in succession, remaining open about four hours during the middle of the day, each time. There are flowers whose opening and closing is regulated, in great measure, by the character and meteorological changes of the weather. Many sorts remain closed at their usual time of opening, if the weather is unfair; and many close their already expanded petals on the approach of rain. A great number of the composite family are not only sensitive to rainy and cloudy weather, but frequently indicate its approach, and prepare for foul weather in advance, by closing up their gold and silver petals. The Calendula pluvialis is a common instance of this; its flowers do not open in the morning, when it will rain during the day. I have observed the same phenomenon on the part of the Portulacca. There is a species of sonchus that does not close at night when it will rain the following day. Linnæus denominated flowers indicating this sensitiveness to atmospheric variations, *meteoric*. In general, it may be said, that flowers being the receptacles and protectors of the organs of reproduction, will wither when those organs have performed their functions. Some are, hence, short-lived, because the organs are matured at the moment of expansion, or very soon after; and the anthers shed their pollen dust almost immediately. Such flowers fade in a few hours; others require time and the exposure of their undeveloped organs to the air and sun, before they are sufficiently matured to fulfill the purposes of their creation. In some flowers, again, the stamens burst their anthers at once, and simultaneously; in others, successively at more or less extended intervals. The first will wither sooner than the last. Double flowers, that have nothing to do, and the diœcious, that depend upon the wind and insects, remain open longer than others.

There are many interesting and surprising facts connected with this subject, which still need illustration and classification. I have only hinted at some of the more prominent. The field of observation in this direction is large and inviting, and should not be neglected by those who can find beauty and wisdom and happiness in considering with discrimination and care, the "flowers of the field."

J. W. W.

Blue Flowers.

Of any collection of plants, in the garden or green-house, how few will be found that have blue flowers. It is true the number of known flowers of this color bears but a small ratio to the extensive catalogues of those of other colors; and blue may be considered comparatively rare. Nature's compensations are on a grand and infinite scale. Having carpeted the earth with green, and spread over it an unchanging pavilion of blue, she enlivens the whole with gorgeous touches of purple and gold, upon the snowy veil that falls with the shades of evening upon the retiring sun, and scatters over the green hillsides and meadows, a profusion of gay flowers, rich in their ever varying tints of crimson and orange, and rose and yellow, and scarlet and white; while here and there, the occasional and solitary glance of some humbler and retiring worshiper reflects the deep blue of the azure canopy above them all.

There are, however, many blue flowers worthy the attention of amateurs and florists, still unknown; at least, in this part of the country. I think I shall do a service to the lovers of beautiful plants, by enumerating a few whose flowers are blue, of various shades, from dark to light—all of them worthy of cultivation, many of them exceedingly beautiful. Some familiar ones I have omitted, as the Linums and Plumbagos, etc.:

Salvia patens—a deep rich mazarine.

Geranium Ibericum—delicate sky-blue.

Calectasia cyanea—very pretty shrub.

Passiflora coerulea—one of the prettiest of the genus.

Didiscus coerulea—a beautiful bouquet flower.

Selago spuria—a shrub, with fine blue corymbs.

Amethysta coerulea—pale coerulean.

Napoleona imperialis—very curious and interesting.

Plectranthus fruticosus—a fine blue-flowering shrub.

Echium candicans — a very beautiful plant.

Omphalodes verna—flowers in short azure bunches.

Alona coelestis—flowers very large and beautiful.

Gilia capitata, *var.*, and G. Achilleæfolia—the last is very fine.

Gelasina azurea—an Iris, of a rich azure.

Leschenaultia biloba—shrubby, fine bloom.

Phlox coelestis—fine free bloomer, clear blue.

Solanum coriaceum—a valuable Mexican shrub.

Pentstemon ovatus, and especially P. gracilis—very beautiful.

Delphinium grandiflorum, and D. Barlowii—the last very desirable and fine.

Scabiosa Caucasia—delicate blue.

Lathyrus Magellanica—a splendid vine.

Herbertia pulchella—a bulb, very handsome.

Conanthera Campanulata—also a bulb, sky-blue.

Myogolum nutans—very rich blue, nodding spikes.

Ruellia varians—handsome, rich blue.

Justicia amabalis — very graceful and pretty.

Gloxinia speciosa, and hirsuta—beautiful color.

Heteropteris coerulea — climbing, light blue.

Thunbergia grandiflora—climbing, magnificent plant.

Convolvulus verticillata—a very pretty twiner.

Nymphæa coerulea—very fine water plant.

Pondeteria azurea, and P. lanceolata, are also very beautiful blue aquatics.

Catharanthus pusillus—very elegant.

Campanula azurea, and Alpina Augustifolia, and many other species—all beautiful.

Symphytum, Caucasicum and patens—showy border flowers.

Cyanotis, axillaris and barbata — very pretty and very blue.

Conospermum coeruleum—ornamental.

Statice articulata, and Scabra Caroliniana, and other species—very cheerful, desirable plants.

Duranta macrocarpa, and dentata—very pretty stove shrubs.

Columnea trifoliata—attractive and interesting.

The list embraces plants adapted both for the garden and green-house. Other plants might be added, but these will be found worthy the immediate attention of florists, and thus this lovely and favorite, but rare color, will be better represented.—J. W. W.

Flowering of our Native Plants.—No. IV.

FLOWERS OPENING IN JUNE.

Ambrina Botrys—Jerusalem Oak.
Aristolochia Serpentaria—Virginia Snake-root.
Arum Dracontium—Dragon-root.
Aplectrum hyemale—Putty-root.
Asclepias incarnata—Swamp Milkweed.
" phytolaccoides—Poke Milkweed.
" quadrifolia—Four leaved Milkweed.
Baptisia leucantha—False Indigo.
" Australis—Blue Indigo.
Calystegia Spithamæa — Downy Bindweed.
Cassia Marilandica—Wild Senna.
Ceanothus Americanus—New Jersey Tea.
Erigeron Philadelphicum—Purple Erigeron.
Gleditschia triacanthos—Honey Locust.
Gillenia Stipulacea—Wild Ipecac.
Lilium Canadense—Wild Yellow Lily.
Liparis liliifolia—Shining Two-blade.
Lysimachia ciliata—Hairy Loosestrife.
" lanceolata — Lance - leaved Loosestrife.
Melanthium Virginicum—
Nelumbium luteum—Yellow Pond-lily.
Pentstemon pubescens—Beard-tongue.
Polygala Senega—Seneka Snake-root.
Psoralea Onobrychis—Scurvy Pea.
Ptelia trifoliata—Shrubby Trefoil.
Rhexia Virginica—Deer Grass.
Rosa rubiginosa—Sweet-brier.
" Carolina—Swamp Rose.
" setigera—Climbing Rose.
Rudbeckia hirta—Rough bone-flower.
Saururus cernuus—Lizard's Tail.
Scutellaria versicolor—Skull-cap.
Spiræa lobata—Meadow Sweet.
Tilea Americana—Basswood.
Tradescantia pilosa—Hairy Spiderwort.
Vitis æstivalis—Summer Grape.
" cordifolia—Winter Grape. L.

Cincinnati, May, 1854.

THE LACE-BARK TREE.—In the West Indies is found a tree, the inner bark of which resembles lace, or net-work. This bark is very beautiful, consisting of layers which may be pulled out into a fine white web, three or four feet wide. It is sometimes used for ladies' dresses.

Frosts of Valleys.

It appears perfectly plausible to suppose that hilly situations, exposed to all the violence of the bleakest winds, should be considerably colder than sheltered valleys, or level districts; and as far as the human feelings are concerned, the assumption is mainly correct. But those who have observed the phenomena of nature, and not allowed any fact to pass unnoticed, or without seeking some satisfactory explanation, well know that vegetation is affected very differently to man under certain conditions of temperature, and that frost, which is generally most fatal to plants, is far more prevalent in valleys than on hills.

This statement is by no means novel. It has long since been ascertained that the coldest air has the greatest specific gravity, and must necessarily, by its own force, accumulate in the lowest localities. Moisture, too, being more abundant in valleys, as well in the soil as by the constant exhalations of the streams that usually flow through them, increases both the density and the coldness of the atmosphere, and renders the occurrence of frost more likely.

Several striking proofs of this position were presented to our observation during the last season. It will be remembered that in the month of September a frost occurred which, in most places near London, destroyed the dahlias then in flower. Those gardens, especially, which lie in the vicinity of the Thames, had all their tender ornaments killed. We noticed at Chiswick some fine collections of dahlias most completely mutilated. At Ealing Park, however, the seat of Mrs. Lawrence, which is situated on a much higher level, none of the dahlias appeared to be injured. Those at Chatsworth, again, growing in a valley watered by a moderate-sized river, were greatly damaged, and their flowers entirely cut off for the season; while on the exposed moors near Sheffield, where the cold seemed much more intense on account of the keen winds which prevail, we saw dahlias and roses blooming for nearly a month afterward in uninterrupted vigor.

We bring forward these simple cases, not, as already hinted, to support a new principle, but to establish and add force to one which is far from being properly considered.

It has been clearly shown that an exotic plant which, perhaps, is as susceptible of injury as any other at present cultivated, and is, therefore, an excellent test of the temperature of any locality, suffers much more, and sooner, in a comparatively protected vale than at a greater altitude which is utterly unsheltered. The notion of placing plants in a low spot to provide them with a natural screen from the wintry winds, must, consequently, be altogether abandoned.

To the person anxious to acclimatize exotic plants, whether he be choosing a fresh residence, or selecting a spot in his domain suitable for the purpose, we recommend reflection on the foregoing remarks. Yearly experience attests, that while specimens planted on the sloping surface of hills sustain, unharmed, almost any degree of frost, those assigned to a low level are ever more or less frozen. It should be recollected, that the majority of the plants which we strive to naturalize are from the *elevated parts* of tropical or warm countries, and are very rarely, or in only a few instances, found in the plains of more temperate regions. Such a consideration is peculiarly instructive.

In the first place, it impresses us with the fact, that they are mostly beyond the reach of the moisture evaporated from large bodies of water. Secondly, it proves that the soil on which they grow is *not very deep*, and particularly *well drained*. And, lastly, it demonstrates that, from their position, the action of the sun and wind must perpetually preserve them from too rank a luxuriance, and effectually ripen their newly-developed wood.

The beautiful Himalayan and Mexican species of pinus, and other trees and shrubs from the same or similar districts, will never, we are satisfied, have their hardihood fairly determined, until they are placed above the immediate influence of rivers or lakes, and on a slope that in some measure approximates to their native hills. We are familiar with gardens in which both this and a contrary course have been adopted, and some, also, wherein only a fertile glen or level is employed. The results, as far as they have yet been manifested, uniformly confirm our previous declarations.

Lest it should be imagined that the effect on vegetation of a difference of temperature between hills and valleys is solely absolute, or arising entirely from the intense coldness of the atmosphere, we shall rectify any such partial view. From the greater humidity of the air and soil, and the diminished agency of sun and wind, plants in low places are always more charged with moisture, and their growth is more exuberant and less mature than those which inhabit hilly tracts. Hence, in addition to the increased amount of frost to which they are liable, they possess within themselves the means of rendering it more destructive. We would now expressly caution every cultivator against planting tender species either in valleys or very expansive plains, and press upon them the importance of choosing an open, inclined surface for naturalizing exotic plants.—*Pax. Bot. Mag.*

Sleep of Leaves.

The phenomenon to which we allude is called the sleep of plants. This consists in a periodic change in the position of an entire leaf, or of the several leaflets of which a compound leaf is formed. The petioles, or leafstalks, either bend upward or downward, so that the flattened surface or limb of the leaf is elevated or depressed. There are about a dozen modifications in the manner in which the leaves are inclined to the stalks on which they grow; some raise their leaflets so that their upper surfaces are brought into contact; and others depress them so that their under surfaces meet together. This phenomenon is best exhibited by various species of the two natural orders: the *Leguminosae*, (which includes both the pea-flowering plants, as clover, &c., and the acacias and mimosas, &c., which have regular flowers,) and the *Oxalideae*. These phenomena depend upon a special physiological law, subject, in some degree, to the stimulating effects of light and heat, which elicit and control them, but which are not themselves the primary causes of these effects. When the sensitive plants are confined in a dark room, their leaflets periodically fold and open as usual, except that the periods are somewhat lengthened; on the other hand, when they are exposed to a continued light, these periods are shortened. When exposed to strong lamplight by night, and excluded from all light by day, their periods of sleep become extremely irregular for a time; but

in the end, the specimens generally close their leaves during the day, and unfold them at night.

The alternate opening and closing of flowers is a similar function to that of the sleep of leaves. The time of day in which flowers close is very different for different species, and even differs for that period during which the leaves are asleep on the very same plant. Bertholet mentions an acacia in the garden at Arotava, in Teneriffe, whose leaflets closed at sunset and unfolded at sunrise, whilst its flowers closed at sunrise and expanded at sunset.—*Henslow's Botany.*

The Origin of Weeping Trees.

I have never seen a printed report of the manner in which these different varieties of trees have been discovered; for example, the weeping oak. The cause of this neglect may be, that persons finding such varieties, either do not examine their origin, or keep it secret from personal interest. The following observations, therefore, may not prove uninteresting. Fascicles, or bundles of shoots, are often observed on trees, which resemble a bird's nest at a distance, but when examined they prove to be a cluster of small twigs. Such bundles are observed on different trees, but more frequently on the white, or common birch tree, (*Betula alba.*, L.) In the year 1808, I observed such a bundle on a *Crataegus, Mespilus*, and *Oxyacantha*, and grafted young thorns with them, which, in two or three years, produced beautiful branches. About the same time I observed such a bundle on *Ulmus campestris*, the eyes of which were budded on healthy young trees, and every one produced a long hanging shoot. According to this observation, it would be very easy to procure a large collection of drooping, or weeping, trees. Our gardeners, however, multiply no species so numerously as the *Fraxinus excelsior, var. pendula;* which variety often retains its hanging character when raised from seeds. We possess several such trees, of about ten feet in hight, which were raised from seed of the original tree, obtained in 1780 from a nurseryman, who found it a few years previously to that in the neighborhood of Newmarket, in Cambridgeshire. — *Gardener's Mag.*

Botany and Agriculture.

BY H. W. RAVENEL, OF SOUTH CAROLINA.

Agriculture may justly be styled the Mother of the Arts. First-born of them all, she began her life coëval with man's existence—and the undisputed motto on her banner, *E terris omnes Opes*, confirms the priority of her birthright. She claims the post of honor, as well as of antiquity. Standing at the confines between the organic and inorganic world, her province is to restore and to reanimate—to reclaim from the dead and effete mass of unorganized matter, the living forms which beautify and adorn the earth. She guards the portals of death and decay. She stands at the outer point of that great circle of life, and as the elements which once dignified and adorned the living forms are passing away (as "all things do pass away") to the kingdom of death and dissolution, she touches them with her magic wand, and lo! they again re-arrange themselves at her bidding. They pass into the various, ever-changing forms of vegetable life—from thence they ascend to animated beings, ever going upward, till in its highest form among the Carnivera, when the circle seems broken, and the elements are about to pass into inorganic matter, she bids them reunite to form the vegetable tissue, and commence once more the ceaseless round.

It is not with Botany only that Agriculture is connected. She bears varied and intimate relations with many other departments of Science and Arts. It is from the very multiplicity of these relations, that the progress of agriculture has been retarded. She has been reproached as laggard and slow to catch the spirit of the age—as remaining content with old ways and old notions, when all other professions and pursuits are moving onward. The charge is not a just one. Her progress has been steady and forward. It has been sufficient to meet all the demands of the age—to fulfill all that the necessities of the world have required of her. If she has not reached that degree of perfection as a science which many others have, the cause is obvious. Theirs it is to seek out and investigate a particular department of inquiry; hers to receive contributions from all, and with these materials to construct her system. Theirs is more special, hers more general. Until all these tributaries can furnish their aid, her system, as a perfect structure, must remain unfinished.

These sciences with which Agriculture is so intimately connected, these tributary departments of human knowledge, though they have made wonderful progress, and reached a high state of advancement, are far from being perfect, and in a state to furnish, in all cases, perfectly reliable data. Agriculture

has been taught by dearly-bought experience to be cautious in receiving their deductions. She has learned a lesson of prudence—and prudence must not be confounded with sluggishness and sloth.

An enumeration of a few of the relations which Agriculture bears to some of the natural sciences, will exhibit at a glance the complexity of influences which must be taken into consideration, before she can derive any material aid from these quarters.

From *Physical Geography* we obtain a knowledge of the latitude of any particular region, of its elevation above the sea, of the distribution of land and water, and of the character of its surface, whether mountainous, hilly, or level, as exhibiting its capacity for drainage—all of these things having their influence upon the vegetation and capabilities of production of a country.

But in order to obtain more efficient knowledge on these points, we must call in the aid of *Meteorology*, to give us a more exact representation of the climate, and its adaptation to any particular production; for neither does latitude, nor elevation above the sea, give us constant elements in our calculations of climate. The science of Meteorology furnishes data which come much nearer to our wants, but in general results is yet unsatisfactory.

Meteorologists have ascertained that there are certain places which have a mean annual temperature. The lines connecting all these points, and carried around the earth, are termed Isothermal lines, or lines of mean annual temperature. But these Isothermal lines do not give us an exact picture of the climate, for in one place we might have very cold winters and very hot summers, which will give a mean temperature corresponding to a place of more equable distribution.

Another set of lines connecting all points which have the same mean temperature, (which is the season for the growth of vegetables,) and called Isotheral lines, makes a nearer step toward the elucidation of climate. But if we conclude from hence that all places on the same Isotheral lines have the same climate, and a like capacity of production, we shall be led into error, for these lines might connect places which have their summer months varying in duration, one place gaining from intensity of heat what it loses in length of time, and *vice versa*—conditions which affect vegetation in very different degrees.

From this science we learn, also, the general laws of the distribution of rain, and the mean annual fall of water in different seasons—but to be of use in estimating the character of a climate, it must tell us in what proportion this fall of water is distributed among the seasons—whether more or less falls in winter, in the growing, or in the harvest time.

This subject will again be referred to in a subsequent place—it is only introduced here to exhibit the complicated relations which agriculture bears to the kindred sciences, and to warn us against placing too implicit a confidence in the data which they furnish as to their general facts.

From *Geology* and *Mineralogy* we learn the origin of our soils by the decomposition of the rocks and earthy strata which every where surround our globe. The general results which we obtain from these sciences are highly important, and deeply interesting to the agriculturist—and are valuable aids to a system of scientific agriculture. But they teach us only the mechanical properties of soils—the texture, whether close or open—the capacity for drainage, plowing, and tillage. To obtain a more intimate knowledge of their productive properties, we must call in the aid of *Chemistry*. This science, perhaps the most important of those connected with agriculture, opens to us a vast flood of light, which, when properly directed, can not fail to be productive of most beneficial results to practical agriculture.

Chemistry may be called the hand-maid of agriculture. It pervades and ramifies through the system in every direction. There are scarcely any operations, even of the plain, practical farmer, who may never have heard of such a science, which are not based upon chemical principles. It teaches us the effect of drainage, in warming the soil, in producing new combinations, destroying deleterious agents, or converting them into nutritious food for growing vegetables. It teaches us the chemical qualities of those constituents of which our soil is composed, and of the plants which we wish to grow, and thus opens the whole system of *manures*.

It explains the effect of light and shade, and of the chemical properties of the sun's rays upon growing plants—of the excess or deficiency of moisture in the soil, and thus enables us to apply practically the facts obtained from Meteorology.

But here also we must be careful that we are not misled by crude deductions and hasty conclusions. The very variety and complexity of relations warn us that they may become sources of fallacy and error. That which, when used aright, might direct us to useful results, in unskillful hands might mislead and betray.

I have thus merely glanced at some of those multifarious relations which agriculture bears to the kindred departments of natural science. I shall now confine my attention more strictly to the subject indicated by your Executive Council.

(To be Continued.)

Rain-Water and Cisterns.

The great mass of country residents, says the New England *Cultivator*, seem to have no more conception of the enormous floods of clear, pure rain-water that annually pours off the roofs of their dwellings, wood-houses, barns, sheds, and other out-buildings, than if they never heard of such huge watering-pots as the clouds in the sky. If all the rain which falls in the northern States within a year, should remain upon the surface of the earth, without sinking into it and running off, it would form an average depth of water of about three feet; in the southern States it would be more; in the American tropics it would amount to about ten feet; and near Bombay, in Asia, to twenty-five feet.

Every inch of rain that falls on a roof yields two barrels to every space ten feet square; and seventy-two barrels are yielded by the annual rain in this climate on a similar surface. A barn thirty by forty feet, yields, annually, 364 barrels—this is enough for about one barrel a day, for every day in the year. Many of our medium landlords have, however, at least five times that amount of roofing on their dwellings and other buildings, yielding, annually, more than four thousand barrels of rain-water, or about twelve barrels, or one hundred and fifty ordinary pailfuls daily. A very small portion of this great quantity is caught in the puny and contemptible cisterns and tubs placed to catch it; but full-sized, capacious reservoirs, fit to hold this downward deluge, we know not where to find, even in a single instance!

It is true, that where a constant draught is made on a cistern, it need not hold the full year's supply—even one sixth part will, in general, answer, as the variations in the wet and dry seasons do not often amount to more than the rain of two months.

In regard to the proper construction of cisterns, the *Working Farmer* remarks: "In our neighborhood, cisterns are made of this (Rosendale, or Hydraulic) cement. We first dig a hole in the ground of the desired size, and then, with a brush, coat the sides with a thin cream of hydraulic cement and water. The fluid portion is absorbed by the soil, and this thin coating prepares the surface to receive a coating of one and a half to two inches, of a mixture of one part hydraulic cement to two parts sand, with which the side and bottom of the cistern may be coated, with the assistance of a common plastering trowel. This cement wall reaches to within eighteen inches of the top of the ground, when one course of brick is laid on top of the wall and projecting beyond the outside of it, also hold in the cement. On this brick, timbers and flooring are laid across, and then covered with earth. Such cisterns will last as long, and are as tight as any other, and may be made at light cost.

"We have several such cisterns on our places, for holding rain-water, liquid manures, etc., and they are all tight".

Age of Plants.

Some plants, such as the minute fungi, termed mold, only live a few hours, or, at most, a few days. Mosses, for the most part, live only one season, as do the garden plants called annuals, which die of old age as soon as they ripen their seeds. Some, again, as the fox-glove and the holly-hock, live for two years, occasionally prolonged to three, if their flowering be prevented.

Trees, again, planted in a suitable soil and situation, live for centuries. Thus the olive-tree may live three hundred years; the oak double that number; the chestnut is said to have lasted for nine hundred and fifty years; the dragon's blood-tree of Teneriffe may be two thousand years old; and Adanson mentions banians six thousand years old. When the wood of the interior ceases to afford room, by the closeness of its texture, for the passage of sap or pulp, or the formation of new vessels, it dies, and by all its moisture passing off into the younger wood, the fibers shrink, and are ultimately reduced to dust. The center of the tree thus becomes dead, while the outer portion continues to live, and in this way trees may exist for many years before they perish.—*Pax. Bot. Mag.*

TOBACCO.—"The habitual use of tobacco was never calculated for health or substantial comfort, or to prolong life. It destroys all these. Notwithstanding the slow and insidious manner in which it poisons the vitals and undermines the constitution, it is yet seen that it occasions, every where, a frightful waste of life. In the United States, intelligent physicians have estimated that 20,000 die every year, from the use of tobacco; and in Germany, where the streets, as well as the houses, are literally befogged with tobacco smoke, the physicians have calculated that, of all the deaths which occur between the ages of 18 and 35, *one half* originate in the waste of the constitution by smoking! Such opinions as these, from men who ought to know, should startle all the world, and bring chewers and smokers to their senses, in regard to the powers of this Indian weed, and the effects of habits which too many have been inclined, hitherto, to call harmless."

Vitality of Seeds.

To multiply and replenish the earth, was one of the early commands of Infinite Wisdom. To fulfill that command, certain conditions are requisite, both in the animal and vegetable world. In our remarks, at this time, we shall *only* have to do with those conditions connected with vegetable life. It seems to be one of the great objects of nature, that our soils should continually be covered with a growth of vegetation, of one kind or another, or of a mixed growth of various sorts. And further, there seems to be, to a great extent, a law of rotation connected with vegetable life. And to sustain and carry out these beneficent intentions, seeds containing the germs of the future plants were necessary. And it also was requisite that they should be endowed with powers of vitality far transcending any thing known in the animal kingdom: this was essential to prepare them to safely meet the various contingencies to which they would be subjected.

The chit of a grain of corn, wheat, or any other seed, alone contains the germ; all other portions of the kernel are mere reservoirs of nutriment for the germ until it is enabled to draw its sustenance from other sources. This reservoir of food consists of starch (a substance insoluble in cold water,) gluten, or vegetable albumen, and minute portions of mineral matter. When seeds are buried deep in the earth, beyond the influences of light, heat, and air, they will remain for centuries unchanged, evincing no signs of life, and yet, when turned up, or brought near the surface, they will as speedily germinate, as if they had only taken a single winter's nap. This fact we find verified in the great variety of plants that spring up from railroad cuttings; from the soil thrown up from ditches, and in the myriads of herbaceous and woody plants that spring up on newly cleared land, from which the forest growth of centuries had been cleared off by burning.

Soon as germination commences in a seed, there is formed at the base of the germ, from the gluten, or nitrogenous portions of the seed, a substance to which chemists have given the name of *diastase*. This possesses the property of making the starch soluble in *cold water*, and prepares it to pass into gum, then into sugar; this, in solution, is the food of the young plants.

From the foregoing, "we see how bountifully nature has provided in the seed for the nourishment of the young plants, how carefully the food is stored up for it, and in how imperishable a form. For hundreds of years the principles of life will be dormant, and for as many the food will remain sound and undiminished till the time of awakening comes. Though buried deep in the earth, the seeds defy the exertions of cold or rain, for the food it contains is unaffected by cold and absolutely insoluble in water. But no sooner is the sleeping germ recalled to life, by the access of air and warmth and duly tempered moisture, than a new agent is summoned to its aid, and the food is so changed as to be rendered capable of ministering to its early wants. The first movement of the nascent germ, (and how it moves, by what inherent or impartial force, who shall discover to us?) is the signal for the appearance of this agent—diastase—of which, previous to germination, no trace could be discovered in the seed. At the root of the germ, where the vessels terminate in the farinaceous matter, exactly where it is wanted, this substance is to be found; there, and there only, resolving and transforming the otherwise unavailable store of food, and preparing it for being conveyed either to the ascending sprout or to the descending root. And when the necessity for its presence ceases; when the germ-leaf becomes developed, and the root fairly entered the soil; when the plant is fitted to seek food for itself, then this diastase disappears, it undergoes itself a new conversion, and is prepared in another form to contribute to the further increase of the plant."

"How beautiful and provident are all these arrangements!—how plastic the various forms of organic matter in the hands of the All Intelligent!—how nicely adjusted in time and place its diversified changes! What an apparently lavish expenditure of forethought and kind provision, in behalf even of the meanest plant that grows."

The facts here presented, account for the appearance of the different species of plants and trees, that succeed the removal of a heavy growth of wood and timber. It also accounts for the rotation of grasses that frequently takes place in our mowing fields in the course of six or eight years. First two years clover, then herds grass, succeeded by redtop, this followed by June grass, and then wire grass. This may continue unchanged for years: but occasionally, when the "right conditions have been brought about," by the peculiarities of the seasons, red clover and white honeysuckle will suddenly make their appearance, thickly interspersed with the finer varieties of the grasses of the old mowfields; and then a fair crop of the first quality of hay is the result; but after one or two seasons, the clover is eradicated and wire grass makes the crop.

Within the past twenty years we have cut the heavy growth of trees from land that had never before been cleared. Some portions have been turned over and sown to grass. Other tracts have been left to spring up to wood, while some of the burned land was sown down to grain. The two last named, soon produced immense numbers of seedling plants.

Where the dense forest had been removed, the fire-weed, the garget, the thistle and mullein, among the herbaceous, and the raspberry and blackberry, among the woody plants, as also vast numbers of seedling trees, such as the sumach, witch hazel, poplar, red and yellow oak, black and wild cherry, sprang up. None of these were growing on the land at the time the growth of trees was cut off. Doubtless, centuries back, these various kinds of trees, shrubs, and plants grew upon these tracts of land, had matured and shed their seeds there, and these, in a sound and dormant state, had safely weathered the effects of rain and cold, and all the changes of the seasons, for centuries. But obeying the laws of rotation, that growth had long since passed away, and was succeeded by different species of trees; when these were cleared off by the ax and fire, the right conditions were brought about for the awakening of these dormant seeds of bygone centuries; by the access of light, air, warmth, and duly tempered moisture, the sleeping germs were recalled to life, to again cover the denuded soil with a growth of vegetation; thus fulfilling "one of the great objects of nature." Hence the reason why the seeds of plants have been endowed with such wonderful powers of vitality.

In relation to the length of time seeds will lie dormant, we will relate a fact that has come under our observation.

Some years ago, a farmer drew us a load of muck, taken from the bottom of a ditch, more than three feet from the surface of the swamp he was draining. The muck we mixed with some green manure from the horse-stable, and the heap was shoveled over occasionally for a few weeks. It being in September, there was a considerable degree of heat generated, and the whole mass became fine and friable—the compost was used about our garden, and in making a bed with sand for bulbous-rooted flowers. We thought we had got a compost free from weeds, or their seeds, but, the next spring, was greatly surprised at seeing hundreds of seedling trees springing up where the muck had been applied. There seemed to be every kind of tree that grew in, round, or about the swamp from which the muck was taken—viz: ash, elm, poplar, birch, willow, &c. The muck was taken from the newly cut ditch directly to the cart; the seed had doubtless been deposited there centuries ago, and if they had not been disturbed, they might have preserved their vitality for centuries to come, and then, under favorable circumstances, would have sprung into life with all the luxuriance of the seed of a previous year's growth.—*Gran. Farmer.*

Manure.—In all places where manure is protected from the sun, and from much washing by rains, its value is greatly increased.

Coldest Days.

In the Wisconsin and Iowa Farmer, may be found a record, which shows what they have to suffer up in the north.

Burlington, Feb. 17, 1854.

The observations were made with a thermometer that was hanging exposed, in the shade. I have, for convenience, used the sign — (less) for below zero.

The observation of January 23d, of this winter, was made after the cold had sensibly decreased the night previous—as far as I could judge by my feelings, was decidedly the coldest I ever knew.

As I am a great enemy to cold weather, I have been more particular to note down, from time to time, the coldest days of our climate; and, as there are, perhaps, others as "tender" on this point, it may not be amiss to let them know how low a temperature they can stand, and yet live.

A Table, showing the Three Coldest Days in each Winter, for Nine Successive Winters.

1845–6, Dec. 19, at 8 o'clock, A. M., — 18°. Dec. 20, at 7 o'clock, A. M., —11°. Feb. 26, at 7 o'clock, A. M. — 20°.

1846–7. Jan. 7, at 8 o'clock, A. M., — 17°. Jan. 10, at 8 o'clock, A. M., — 24°. Jan. 16, at 8 o'clock, A. M., — 14°.

1847–8. Dec. 26, at 8 o'clock A. M. — 12°. Jan. 9, at 8 o'clock, A. M., — 12°.

1848–9. Jan. 16, at 8 o'clock, A. M., — 18°. Jan. 18, at 8 o'clock, A. M., — 22°. Feb. 18, at 8 o'clock, A. M., — 22°.

1849–50. Dec. 25, at 8 o'clock, A. M. — 16°. Dec. 30, at 8 o'clock, A. M., — 18°. Dec. 31, at 8 o'clock, A. M., — 20°.

1850–1. Jan. 29, at 8 o'clock, A. M., — 15°. Jan. 30, at 8 o'clock, A. M., — 24°. Jan. 31, at 8 o'clock, A. M., — 18°.

1851–2. Dec. 15, at 7 o'clock, A. M., — 19°. Dec. 17, at 7 o'clock. A. M., — 20°. Jan. 19, at 8 o'clock, A. M. — 28½°.

1852–3. Jan. 26, at 8 o'clock, A. M., — 6°. Feb. 8, at 8 o'clock, A. M., — 8°. Feb. 9, at 8 o'clock, A. M., — 12°.

1853–4. Jan. 6, at 8 o'clock, A. M., — 20°. Jan. 21, at 9 o'clock, A. M., — 20°. Jan. 23, at 9 o'clock, A. M., — 25°. D. M.

The Sorrowful Tree.—At Goa, near Bombay, there is a singular vegetable—the Sorrowful tree—so called because it only flourishes in the night. At sunset no flowers are to be seen; and yet, half an hour after, it is quite full of them. They yield a sweet smell; but the sun no sooner begins to shine upon them, than some of them fall off, and others close up; and thus it continues flowering in the night all the year.

Wood Paper.

The scarcity of paper materials has become a question of great moment, and paper makers, as well as philosophers, have been anxiously looking for a substitute for rags. The American Agriculturist thus introduces the subject:

In the making of books there is said to be no end; their rapid increase during the last few years, has led to the discovery that the cotton and linen rags of the world are altogether insufficient to meet even the present demand—the daily press of our large cities alone would almost exhaust them. One of our city dailies, we see, demands for its ordinary use, nearly twice as much paper as the whole of the immense annual issues of the American Tract Society. Under such circumstances, the following article from the *London Gardeners' Chronicle*, contains suggestions at once timely and important for American readers.

The small market value of SOFT-WOODED TREES is such as to render them scarcely worth attention among planters, except under very peculiar circumstances. When Willows, or Limes, or Poplars, or Sycamores, or any such species are felled, they are in so little demand, that after a small quantity of the best has been taken for the turner, toyman, or butcher, the rest may go as firewood. There is now, however, some prospect of their coming into consumption on a very large scale in an unexpected manner, for which, if anticipations are realised, we shall have to thank the Great Exhibition of 1851.

It appears that at a late meeting of the French Society for the Encouragement of National Industry, a paper was read, explaining how such wood may be converted into paper. The bark is taken off, and the wood is reduced into shavings; the shavings are then cut very thin; they are next placed in water for six or eight days, dried, and afterward reduced to the finest powder possible by a corn-mill. This powder is mixed with rags, which serve to prepare the pulp of paper, and the ordinary operation of paper-making is proceeded with. All white woods, such as the Poplar, the Lime, and the Willow, are suitable for the purpose, but the discoverer ascribes a good deal of his success to the quality of the water he employed—that of the little river Doller, which runs near Mulhausen. For the first experiment he employed the wood of the Aspen. Specimens of the paper so obtained were laid before the meeting, but we are not informed of its quality.

No doubt can exist that wood may be made into paper, provided it can be reduced into threads or particles fine enough for the purpose. For what is Flax or Hemp except wood, whose fibers are readily separable? There is no difference between the wood of Hemp and of Willow, or other soft trees, than such as arises from the greater cohesiveness of the threads of the latter, or from greater toughness, which is not a difference of importance in paper-making, for the weakest wood in the world is stronger than cotton dross, now so largely used in all paper-mills. The only question is, can the cohesiveness of fibers be overcome, or does the substance produced by grinding into pulp, either when used alone or mixed with other pulp, present a material fit for paper? We apprehend that it does.

The Mulhausen experiment is reported to have been made with timber. Suppose that the newly-cut branches of Poplars, Limes, and Willows had been macerated for a fortnight, cut into suitable lengths, and then put in a tearing (not grinding) mill, where they could be worked with water, we suspect that good pulp (or at least "half stuff") would have been obtained without a preliminary reduction of the wood into shavings, and an after process of grinding.

That the present enormous demand for paper will lead to the discovery of some new source of fiber, is certain. In fact, it has already resulted in the manufacture of paper from straw, both here and in the United States, and a very good article, though not of a high class, is thus obtained. Our West Indian colonies, indeed, might keep our market amply supplied, with no small profit to themselves: but they do so little except cry for aid to HERCULES, and wring in despair their feeble hands, that we expect nothing from them unless the British Government will take taxes in kind, and allow the inhabitants to pay their imposts with trusses of dry Plantain stems; if indeed it should prove that West Indians would not also, in such an event, expect government officers to reap and pack their Plantains for them.

It appears from a return just issued by the Board of Indian Revenue that, notwithstanding the excise duty on paper, the quantity of that substance manufactured in the United Kingdom has risen from 150,903,548 lbs. in 1851, to 177,633,009 lbs. in 1853, showing an increase of manufacture to the extent of nearly 27 millions of pounds weight in three years. In 1844, the gross receipt for paper duties amounted to 709,320 lbs., and in 1853 to 1,049,662 lbs.; showing an increase of about 340,000 lbs. in the course of nine years. But of that increase, above 190,000 lbs. apply to the last five years, or about 38,000 lbs. a year, representing, we believe, an annual increase of raw material exceeding 6,000,000 lbs. weight.

Let us ask whence these six millions pounds annually added to the wants of the

paper market are to be supplied. Materials are already becoming scarce; the price of paper is rising, and must continue to advance unless an enormous quantity of matter convertible into paper is furnished to the manufacturers. The effect will be something much worse than even an excise duty: the cost of books, newspapers, and every thing else made of paper, must inevitably be enhanced, and a natural permanent tax upon knowledge, as it is the fashion to call the paper duties, will be added to whatever artificial tax the financial necessities of the country may call for.

The remedy probably lies at our doors; it is certainly within our reach. Fibrous plants, not strong enough for linen, but amply sufficient for paper, may be brought into profitable cultivation; as, for instance, the Hemp Nettle, (*Urtica cannabina*,) the Marsh Mallow, or even common Mallows; and the Hemp Mallow, (*Lavatera cannabina*,) to all which our climate is perfectly adapted. In the meanwhile, without awaiting the issue of experiments with such plants, our paper-makers and country gentlemen would do well to ascertain what can be made of their soft woods.

Pulmonaria Virginica as a Border Plant.

This genus of plants belongs to the Natural Order of Borageworts, and from their early flowering, the whole of them may be said to be worth a place in every flower-garden. This species, in particular, deserves such distinction, for it is the most ornamental of the whole family. It is certainly a very choice hardy border plant, and will flourish in any common garden soil, upon a dry bottom, in open, warm situations. It is a native of parts of Virginia, and was introduced from America into England in the year 1699.

Although readily increased by root division, this should be done with a little care, as its fleshy tuberous roots and crowns are rather brittle. To avoid breakage, the whole plant should be taken up when increase is required, and the separation made carefully. In replanting it, there should be equal carefulness, so as not to break its roots more than is necessary. To effect this, work the soil well with the spade, and plant with the hands. This plant is not a very rapid increaser, so that if once well planted in the flower-border, and as a front row plant, since its hight is no more than from nine inches to a foot, it might remain in the same spots for one's lifetime, and then not be too large for its situations. A little top-dressing may be given to it every spring when it puts up its stems.

We have a plant of this which has stood in the same place the last nineteen years. It is now a noble bunch, but not a bit too large for its place, nor should we think it would be so at the end of another nineteen years. The main thing to mind is, that it does not get injured with the spade, trowel, or hoe, during the many months it is out of sight. As it is an early flowerer, (from the end of March to the first of May,) its leaves and stems have all died down by the end of June, and, of course, where it is not kept labeled, it is very liable to be destroyed before its time to put up again.

The whole plant is quite smooth, and of a peculiar bluish or glaucous-green color. Its flowers are large, numerous, and of a reddish-purple before opening, becoming of a light bright blue when expanded.

There are two other species of this genus much allied to the preceding plant, viz.: the *Pulmonaria siberica*, and *P. maritima*. All three are pleasing plants, and may all be treated in like manner as front border plants, in the dry, warm borders, particularly noting where they are planted, so as not to disturb them during their months of rest, when their leaves and stems have died away.

Sulphur and the Grape Disease.

[We cut the following from a recent letter of the Paris correspondent of the Cincinnati Gazette. The determination of the French Commission is important.]

The Commission appointed by the Minister of Agriculture to repair to the department of Thomery, and to report, after a thorough examination, on the best remedy for the disease of the grape-vine, which has caused such ravages in France recently, has made its report. The Commission reports decidedly in favor of the treatment with dry sulphur. At Thomery, where the treatment has been attended with complete success, the sulphur is applied indiscriminately to all the vines, whatever be their mode of culture, whether in rows, beds, or arranged for ornament. The sulphur, reduced into a fine and perfectly dry powder, is thrown on to the vines by means of the *Soufflet Goutier*—a machine from which the powder is blown by the breath. Each application is made going and coming, in order that every surface of the plant shall be brought into contact with the sulphur; three applications are made a year. The first application of the powder takes place after the shoots have attained a length of two or three inches; the second as soon as the vine was flowered, and the third before maturity, when the grape begins to turn. The morning and the evening are preferred for these operations, by the majority of the people at Thomery; but the commission advances reasons for believing that the middle of the day would be better. The results of this treatment last year were all that could be desired, and no other will be resorted to for the present year.

Editor's Bureau.

Strawberries of Cincinnati.

The subjoined letter has been handed to us for publication, by a party feeling themselves aggrieved by the insinuations and assertions respecting the nurserymen of Cincinnati. It is a matter of regret that mistakes have occurred, as occur they will sometimes—witness the plate and descriptions of the *Superior*, in the Horticulturist for September last, in which the fruit does not resemble any of our Cincinnati seedlings known to Cincinnati men. An assertion that must be reiterated for the sake of truth. Unwilling as I am to wound the feelings of the worthy man and excellent pomologist, who conducts that journal, I "*dare*" do what I think right, in full confidence that Mr. Barry will agree with us who know the *Superior* Strawberry, when he shall have fruited the plants sent him in compliance with his order for specimens of the kind we figured for the Superior in our last January issue. If proof were needed, I can say that Mr. McAvoy, himself, assured me, when I showed him the Horticulturist, that the picture did not in the least resemble the fruit of his celebrated seedling.

To. C. M. Hovey, Esq.,

Editor of the Magazine of Horticulture.

Sir:—In consequence of the opposition you have always given to the new Strawberries, which originated here a few years since, an opinion seems to prevail that you have not cultivated the genuine sorts. The public have been told, by yourself, that you bought your plants of us, and it is, perhaps, my duty to show that the sorts we sent you were, in all probability, true to name, except as regards McAvoy's No. 1, in which we subsequently found a mixture of McAvoy's Superior.

Our original stock of these Strawberries was a present from Dr. Jno. A. Warder, who was a very good authority for their accuracy. In our nursery, due care was taken to keep them separate and I challenge any one to show that a mixture ever existed in our beds of McAvoy's Superior, Schneicke's Pistillate, or Longworth's Prolific. These Strawberries had been bought and sold, and had, year after year, beaten all the older sorts in productiveness, vigor, and hardiness, and at least two of them had been pronounced by our Horticultural Society superior in size and flavor to Hovey's seedling, or any other variety known to them, before we had cultivated a plant of any. We had, therefore, no interest, nor had any one else, in giving them circulation. Mr. Longworth had given some away to his friends, who again gave them away or sold them, even before Mr. McAvoy got a premium of $100 for having raised one of them, (the McAvoy's Superior.) In fact, they are indebted solely to their own merits for their notoriety, which, you know, is not the case with some other articles.

But somebody tells you that a spurious Longworth's Prolific has been sent out by some of the Cincinnati nurserymen, and, forthwith, you are driven (by a super-abundance of good nature, I presume,) to the conclusion, that there is no dependence to be placed in the nurserymen here, and that there is no honesty in nurserymen. Virtuous man! are you not at this time offering these very varieties for sale, although you pronounce them worthless, and their purity is questioned by others, and doubted by yourself? Are you not much more culpable than the Cincinnati nurserymen, who sold them with a firm conviction of their value and their genuineness? Some of the nurserymen here, (ourselves included,) bought quantities of plants for Longworth's Prolific, of a tenant of Mr. Longworth's, who had fruited the sort. Many of these had been sold, and a great number planted by ourselves, before they were found to be Schneicke's Pistillate. Did no error of this nature ever occur in your nursery, and in others conducted by men whose integrity could not be suspected? I have reason to believe that all the respectable nurserymen here have these sorts free from mixture now; although, from the nature of the Strawberry plant, and the fact

that they had originally *fruited* amongst hundreds or thousands of other seedlings, it was no easy matter to find a bed entirely genuine a few years ago. I may remark that I do not recollect having ever seen a bed of your own seedling pure, unless in this neighborhood. In fact, much experience is necessary to enable even a close observer to detect a mixture in a bed of Strawberries in every stage of their growth. We shall be ready, next September, to supply Longworth's Prolific, *without charge*, to all persons who purchased the spurious sort of us, and who will furnish us with the proper address, although the honest individual who sold us the plants refused to make any compensation. We will send you a sample whenever you please, to compare your old plants with. However, I think you have the true sorts already.

For several months you have labored hard to write down the new seedling Strawberries which originated in Cincinnati. The public will, no doubt, be happy to learn that nobody has an eye to see, or a tongue to taste, correctly, but a certain horticulturist of Boston. Alas, unlucky McAvoy's Superior, and Longworth's Prolific, why were you not born near Boston, and in the "extensive nurseries!" Why are you not called Hovey's Grand Climax of Perfection, and Hovey's Paragon of Excellence! The Magazine of Horticulture would not condemn your fruit as small or ill-flavored, nor see any dinginess in your color. One, or perhaps both of you, would, ere now, have been trumpeted forth as "the greatest acquisition" which has ever yet been made, and your berries would be warranted "not to drop off or rot under any circumstances," not even, I suppose, under the influence of a hail storm. As yet, however, friend Hovey, the public prefer a good, luscious Strawberry to an acid criticism from a horticultural editor, whose stock of praise is so often put in requisition for his own progeny. Yours respectfully,

M. Kelly.

The Sack-Tree.—There is said to be a tree in Bombay called the Sack-tree, because from it may be stripped very singular natural sacks, which resemble "felt" in appearance.

Acknowledgment — The Concord Grape.

I have to thank Mr. Bull, the originator of this new novelty, for a very polite note accompanying a healthy root of his seedling grape. The obligation is cordially acknowledged, and the vine, carefully planted in virgin soil, is already in leaf, as though perfectly satisfied with its change of locale—another year, at least, must elapse before it can give promise of fruit; in the meantime, it shall be carefully tended, while I must be satisfied to feed on *hopes*, instead of the luscious berries. With all due deference, however, to brother Hovey, I may be permitted to suggest that I have great apprehensions as to my being able to produce fruit that shall compare with his picture of the Concord Grape. It may have the excellent property of early ripening, and therefore be valued at the North; but apprehensions are entertained that it will not maintain the exalted position to which it was raised by the Massachusetts Horticultural Society, through its committee. Don't hurry, good friends, in your decisions of this nature: they are too important, and should be of too much weight elsewhere than in Boston, to be lightly and hastily rendered. Upon good authority the world is informed, that it is "somewhat foxy." I also "*hope*, for the sake of Mr. Bull," and also myself, "that it may prove to be first rate." It is bad policy for dealers to send forth exaggerated statements as to the qualities or merits of new things at the risk of public disappointment, which will be sure to redound to their own disadvantage. Our ten years' experience with the Diana Grape suggests this caution. J. A. W.

The Strawberry Again.

We have received a few lines from W. R. Prince, expressing his "utter astonishment" that Mr. Darlington should have written as he did in our last number respecting Hovey's seedlings, and Mr. Meehan's suggestion as to the *change* of character in the cultivated varieties. Mr. Prince thinks Mr. D. wrong in his facts, and wrong in his deductions, and promises in a future letter to explain his objections, and communicate his own views. We shall publish his communication with pleasure.

Editorial Correspondence.

MR. JAS. W. WARD,

Editor of Horticultural Review:

To understand the sexual character of the Strawberry plant, I think we must threw Linnæus, and all the great botanists and Horticulturists of England, aside, and carefully examine the plants when in blossom, and learn of the ignorant market gardeners. You deem the dispute between our horticulturists, more a dispute about *names* than *realities*, and admit that what we call a staminate, and what we call a pistillate, may never change their character, yet you say it is a mere dispute about words, and say we err, in giving them these names. What would you call them, if not male and female? It is true, that Duchesne, a disciple of the great Linnæus, did discover plants of this character, and so wrote to Linnæus. Linnæus, in reply, told him to keep quiet; that the plants that he saw, which bore no fruit, were not from defects in male or female organs, but from frost. The inquiry there ended with your learned botanists. The great English Strawberry grower, Mr. Keen, to whom you refer, raised a seedling that bore no fruit. On examination, he could find no perfect stamens. He placed his famous seedling hermaphrodite in the same hot bed, and had fruit. He reported the *miracle* to the London Horticultural Society, who took no notice of it, and it again slept. It still sleeps in England. They cultivate hermaphrodites only. If they see a plant with no fruit on it, they say the germs were killed by frost. They now have McAvoy's Superior, and will investigate the subject. But you misunderstand the doctrines of your brother editors. Mr. Meehan pronounced the distinction of no interest, as he could, by a change of heat, make Hovey's seedling, which is a pure pistillate, change its sexual character, and become staminate. A correspondent of the Florist had his beds, in the open ground, change their sexual character daily, with a change of the weather. Your brother of the Prairie Farmer, had his beds change, *not daily, but yearly*. Your brother of the Florist pronounced a seedling deficient in male organs in the same blossoms, *a monstrosity*, and that she would labor day and night, till she had a husband by her side. You hold that the natural character of the Strawberry is to be hermaphrodite, and to bear blossoms perfect in both organs. In other words, you virtually inderse your brother's monstrosity doctrine. I hold directly the reverse. I say, that in our western prairies, where one hundred acres may be found covered with wild Strawberries, that an hermaphrodite blossom, one perfect in both organs, is "like angel's visits, few and far between"—that one hermaphrodite will not be found, to one thousand perfect in one organ only. I believe, in plants raised from seed, not one having both stamens and pistils so perfect as to bear, more or less fruit, will be found in two hundred plants. I intend, this and the next season, to test the question. I have often raised two thousand seedlings in a season, but as they do not blossom the first season, they are allowed to run at will, and as the male is stronger than the female plant, when they came into blossom, a very large portion are wholly defective in female organs, and not one in twenty-five hundred have both male and female organs. The authors you refer to, that admit a sexual difference in one variety of Strawberry, were unheeded, and are so to this day, in England. Till the secret was disclosed, Mrs. Arbigust was our only gardener who could raise the Strawberry profitably. From the same space of ground, she raised five times the quantity of fruit as her neighbors, much larger in size, and commanding a higher price. In the spring, she thinned her beds, and threw plants in the street. Her neighbors picked them up and planted them, but not a single fruit would they produce. She threw out her staminates only. I was told that the same was the result when she was a gardener at Philadelphia. Her Strawberries sold from twenty to fifty cents per quart in our market. When her secret became known, at the same periods of ripening, from five to ten cents, and she ceased to cultivate the Strawberry, and turned her attention to other articles that she deemed more profitable. If the doctrines of Mr. Meehan, and your brothers, are to prevail; if botany is to set aside facts, we shall soon have few

Strawberries in market, and old prices. It is said, that a gardener in Kentucky has picked, and sold in our market, more than one hundred and twenty bushels in a day. If he becomes a botanist, his produce for a day may be twenty bushels. You say, you know not why this theory of sexual difference should be called a Cincinnati discovery.

Because it was not known among English gardeners till promulgated here; and not known here, till the accidental observations of a son of a market woman, led to the examination. I had one eighth of an acre in Strawberries, and had not a supply for my family, and bought from Mrs. Arbigust. When her son, a few days before my beds were in blossom, told me that I had but little fruit; that nearly all my plants were males. I then relied on Linnæus. I fear I almost swore at his ignorance. I told him, the Strawberry was a plant that bore blossoms perfect in both male and female organs. He replied, that he was no botanist; that he had so been told before; but that he knew one thing, that not one plant in a hundred would bear fruit. When in blossom, I examined them, and for the first time discovered a difference in the blossoms, never noticed before. The male blossoms were one half larger than the female. The male organs in the one, could be seen at the distance of fifteen feet—the male, in the other, only on separating the hull, and incapable of impregnating the female at its side. Not one blossom of the male bore even a defective berry. The female, every blossom bore a perfect fruit. Before they were out of blossom, I endeavored to eradicate every male plant. They run freely, and the next season I had a full crop. But I found a few barren males, and before they were out of blossom, cut them all out. The result was, the next season, not a single fruit. The following season I procured some male plants, and supplied their place. I have heretofore believed, that hermaphrodite plants, as the male and female organs were close together in the same blossom, would require no impregnation by insects or by hand. I now hold a contrary doctrine. I say that an hermaphrodite plant in blossom before insects are about, will not bear fruit, unless impregnated by a brush; nor then, in damp weather, when the farina is not dry. To test this, I request persons to cover an hermaphrodite plant, when in blossom, with a fine gauze, through which the smallest insect can not pass, and I say that they will have no fruit. This has been the case in my garden, with early blossoms, when insects were scarce. At the same time, the plants on the south side of a high wall, where the atmosphere was warm, and insects gathered, I had a full crop.

One remark more, about the monstrosity doctrine. I inquired of my tenant, Mr. Schneicke, who has raised some valuable seedlings, what proportion of them he had of hermaphrodites. He replied, in about five thousand seedlings, one hermaphrodite only. If so, is not the hermaphrodite the monstrosity? I do not believe there would be one plant, perfect in both organs, and bearing a full crop of perfect fruit, produced, out of ten thousand seedlings. In England, where they cultivate hermaphrodites only, they have not such a plant. If there be one in America, it is our Prolific.

Yours truly,

N. Longworth.

Lectures upon Horticulture.

The editor of the *Soil of the South* tells us that the citizens of Dallas county, Ala., are enjoying a course of lectures upon Horticulture. Ah! now we see that the North has not all the enterprise of the country. The great State of Ohio, standing in the foremost rank among the producers of vegetable products, has not had a lecture delivered especially upon Horticulture, although many of her sons would do great service to the country by devoting themselves to this pursuit. Alas! they have piped long, but receive no calls to enter upon the duties. I verily believe there is more truth than poetry in the homely reflection of the *Iowa Farmer*, that a few practical men, with a happy faculty for imparting information by lecturing, would do more good, if employed in that vocation, than any of the proposed and so-called agricultural colleges, inasmuch as they would reach the million, while the college exercises, be they never so excellent, could, *directly*, benefit but few.

J. A. W.

Our Illustrations.

In pursuance of the intention announced in an early number of our periodical, we continue in our present issue the promised illustrations in rural architecture and landscape gardening. The designs are all from the beautiful suburban residence of our townsman, W. B. Smith, Esq. Two views of the house are given, one from the front, and the other from the rear of the premises. We are sorry not to be able to give a detailed description; but our chief concern is with the general external features and picturesque effect. A most superb view is obtained from the windows of the tower. The house stands upon the brow of a hill, sloping, by a broken but gentle declivity, toward the Millcreek valley. The disposition of the grounds in front is seen upon the plan, and merits careful attention. The proprietor had many difficulties to overcome, but by aid, finally, of a skillful landscape gardener, and at no little expense, has brought the whole to order, and distributed his roads, and trees, and shrubbery so as to produce a striking and pleasing effect; which will be still further developed and improved, as time shall mature the shrubbery, and give size and form to the various trees with which it is adorned.

We take occasion to give form and force to the experience of Mr. Smith, as he himself has expressed it to us; convinced that it will be confirmed by that of many others, who, with an inadequate appreciation of the difficulties before them, and a real and acknowledged want of the discipline and knowledge requisite to overcome them, have undertaken to plan out and lay out the lawns and drives of their front grounds. We are largely sustained in the statement, that to do this with economy and ultimate satisfaction and correctness, requires an amount of study and observation, combined with a cultivated judgment and the true genius of art, that few even of those who have given the subject long and careful study can be allowed to possess in any competent degree. A man's grounds have an intimate relation to his house, and require as careful a judgment, and as nice a taste in their just distribution and arrangement, as did his house in regard to its architectural beauty and propriety. The wisest and most prudent course is to commit both to the heads and hands of men whose taste and judgment are the result of much experience, and an enlarged study and comprehension of the subject. J. W. W.

Cincinnati Horticultural Society.

The Spring Exhibition of this Association began on Wednesday, the 31st of May, in the Melodeon Hall, and continued three days. The display of flowers was very fine. The fruits consisted only of strawberries and cherries. How these were regarded by the committees appointed to inspect them, will be seen by the subjoined reports. At a subsequent meeting of the Society, the reports of committees were read as follows, and referred to the Council for audit:

THE COMMITTEE ON FRUITS REPORT

That the fruits displayed at this exhibition, although few in number, consisting mostly in Strawberries and Cherries, evinced a most creditable skill in their cultivation—manifested by the extraordinary size and perfection of the specimens displayed. The Strawberries, especially McAvoy's Superior, from Mr. Lavassor, Mr. Hill, and Mr. McAvoy, distinctly show to what perfection that variety can be grown by proper management.

The Hovey's Seedling, by Mrs. Carter, showed, also, that that valuable variety can yet be produced in its pristine excellence. She also exhibited a fine specimen of Burr's Mammoth, very large and good.

Mr. Peticolas also made an excellent display of eleven varieties, to the best six of which a premium was awarded of $3 00. Among them, Jenny's Seedling, large and beautiful, McAvoy's Superior, Longworth's Prolific, Hudson, Burr's new Pine, and Hovey's.

All the other samples, exhibited by other contributors, were also deserving of much praise.

Mr. McWilliams produced a very handsome display of Cherries, for the best five varieties of which a premium of $3 00 was awarded; for May Duke, Early May, Black Eagle, Sparhawk's Honey, Elton.

The Committee also awarded a gratuitous premium of $2 00 for a basket of beautiful Catawba Grapes, preserved in great perfection in cork shavings, by T. V. Peticolas

The whole amount of premiums awarded by your committee runs up to the enormous sum of $8 00.

All which is respectfully submitted.

S. MOSHER, *Chairman.*

AWARDS OF THE FLOWER COMMITTEE.

Sweet Williams, best 4 varieties, double, Messrs. Heaver & Eyler, $2 00.
Verbenas, best 12 varieties in pots, Messrs. Heaver & Eyler, $4 00.
Verbenas, second best 12 varieties in pots, Mr. John Sayers, $3 00.
Verbenas, third best 12 varieties in pots, Mr. S. S. Jackson, $2 00.
Antirrhinums, best 6 in pots, Mr. Saunders, $2 00.
Cinerarias, new seedling, Mr. Saunders, $2 00.
Petunias, 6 varieties in pots, Mr. John Sayers, $4 00.
Remontant Roses, 12 cut flowers, Mr. John Sayers, $3 00.
Remontant Roses, second best 12 cut flowers, Messrs. Heaver & Eyler, $2 00.
Fuchsias, best 6 varieties in pots, Messrs. Heaver & Eyler, $3 00.
Fuchsias, second best 6 varieties in pots, Mr. Henry Williams, $2 00.
Fuchsias, best 4 varieties in pots, Messrs. Heaver & Eyler, $2 00.
Fuchsia, specimen plant, Messrs. Heaver & Eyler, $1 00.
Calceolarias, Herbaceous, best 6 in pots, Messrs. Heaver & Eyler, $3 00.
Pelargoniums, best display, not less than 12, Mr. Lambert, $6 00.
Pelargoniums, second display, not less than 12, Mr. Thos. Knott, $4 00.
Pelargoniums, best 6 display, not less than 12, Mr. Henry Williams, $3 00.
Balsams, best display, Mr. C. Saunders, $2 00.
Scarlet Geraniums, best 3, Mr. Jno. Sayers, $2 00.
Scarlet Geraniums, second best, Mr. Thomas Knott, diploma.
Stove and Green-house plants, best collection of 20, Mr. Jno. Sayers, $10 00.
Stove and Green-house plants, second best collection, Messrs. Heaver & Eyler, $17 00.
Stove and Green-house plants, best specimen plant, Mr. William Cox, Jr., $2 00.
Stove and Green-house plants, best 12 plants, Mr. S. S. Jackson, $6 00.
Best pair hand Bouquets, Messrs. J. Y. & Isaac Jackson, $3 00.
Second pair hand Bouquets, Mr. Thos. Knott, $2 00.
Best pair of 9 inch Bouquets, Messrs. Heaver & Eyler, $4 00.
Second best pair of 9 inch Bouquets, Mr. Lewis Jackson, $1 00.
Best display of all kinds, Messrs. Heaver & Eyler, $5 00.
Second best display of all kinds, Mr. Thos. Knott, $3 00.
Cut Roses, best 10 varieties, Dr. J. A. Warder, $2 00.
Cut Roses, second best 10 varieties, Mr. R. B. Price, $1 00.
Carnations, best 6, Messrs. Toepfert & Beck, $2 00.
Picotees, best 6, Messrs. Toepfert & Beck, $1 00.
Cut Roses, best display, Mr. Jno. Sayers, $7 00.
Best specimen rose, Messrs. Toepfert and Beck, $2 00.

SPECIAL PREMIUMS.

To Heaver & Eyler, for a display of cut Roses, $5 00.
Kelly, Evans & Co., for a display of 60 varieties cut Roses, $3 00.
Messrs Toepfert & Beck, for a collection of rare coniferous plants, $6 00.
Heaver & Eyler, for a display of Scarlet Geraniums, $4 00.
S. S. Jackson, for a display of cut Roses, $3 00.
Mrs. Lambert, for a new and good seedling Verbena, $1 00.
John Sayers, for a collection of Gloxinias, $3 00.
H. Williams, for a display of Bouquets, $2 00.
H. Williams, for a display of cut Roses, diploma.
Miss Harriet Howell, for a design of a Rustic Cottage and Grounds, $3 00.
Mr. S. S. Jackson, for a display of cut Verbenas, $1 00.
W. Orange, for a display of 56 varieties of cut Roses, diploma.
Miss Eliza Bicknell, for a stand of cut Flowers, diploma.
Kelly, Evans & Co., for a stand of cut Flowers, diploma.
H. C. Saunders, for a display of Antirrhinums, diploma.
A. H. Ernst, for a display of Roses, (too late for competition,) diploma.
Toepfert & Beck, for a stand of cut Roses, diploma.
Theodore Pfau, for Miniature Flower Stand and Plants, diploma.

RICHARD DAVIS,
J. P. FOOTE,
GABRIEL SLEATH, } Committee.
JAS. W. WARD,
FRANCIS PENTLAND,

VEGETABLES—LIST OF PREMIUMS AWARDED.

Rhubarb, best 12 stalks, S. Mosher, $3 00.
Rhubarb, second best, Forester & Story, $2 00.
Radishes, best 3 varieties, Curran Sanders, $2 00.
Cucumbers, best pair, Curran Sanders, $2 00.
Cabbage, best 2 varieties, Curran Sanders, $2 00.
Cauliflower, best 4 heads, Curran Sanders, $3 00.
Lettuce, best 3 varieties, 6 heads, Forester & Story, $2 00.
Lettuce, second best 3 varieties, 6 heads, Curran Sanders, diploma.
Peas, best half peck, Curran Sanders, $1 00.
Potatoes, best half peck, $2 00.

SPECIAL PREMIUMS.

For a collection of Vegetables, Forester & Story, $2 00.
JOSEPH DUNLAP,
EDWARD KELLY.

Our Second Number.

So many copies of our February number were distributed as specimens, we have entirely exhausted the edition. Another small edition will soon be put to press, and those who are in want of that number, will be supplied. This will explain to those who have ordered that number, why we have not complied with their request to furnish it.

NOTICES.

THE INDIANA FARMER—STATE FAIR.

This useful periodical comes regularly from the Hoosier State, and brings pleasant news ofttimes therefrom. The editor was recently an important functionary at Washington, not politically, but practically, in the capacity of member of Indiana Board of Agriculture in the United States Agricultural Society. The number for May 1st contains the announcement and premium list of the next Fair of the State Society, of which editor Dennis is the very efficient Secretary. This festival, it will be recollected, will be held at the city of Madison, on the Ohio river, October 2d—6th. In looking over the liberal premium list, it is gratifying to observe that the people of our neighboring State are readers, and desirous for information, as is evinced by the offer of several copies of the Western Horticultural Review as premiums in the fruit and flower department. The senior editor of our journal has been honored by the appointment of chairman of the Fruit Committee, which office he hopes to fill, as he will be ably supported by his intelligent colleagues, unless, forsooth, the locomotive may carry him elsewhere about that time.

TRANSACTIONS.

The American Wine-Grower's Association

Met on Saturday, May 27, 1854, at G. Sleath's residence in Delhi township. After reading the minutes, a communication from Mr Longworth, respecting vine culture, was read, and a vote of thanks was offered, with a desire that it may be furnished for publication.

A communication from Mr. Cozzens, of New York, enclosing a description and original plates of the vine disease at Oporto. These were prepared by the American Consul.

Also, another paper, from N. Longworth, Esq., respecting a new variety of grapes, and accompanying the advertisement of another novelty, the Northern Muscadine.

Mr. Rehfuss then read a paper, compiled from the highest and latest authorities of Europe He illustrated his remarks by showing the beautiful plates of Hugo Mole.

A query as to the effect of close trimming of young grape-vines upon their bearing, was referred to Messrs. Longworth, Mosher, and Buchanan, to report to next meeting.

The discussion of the wines then followed, and was performed with great alacrity, as the specimens were of superior quality, and the judges could not be in better condition, than with the hearty reception and hospitable entertainment that had welcomed their arrival. The meeting was most agreeable, and had been anxiously anticipated as the first of the rural character that was to occur this season. The vineyards, and indeed the whole place, were in most beautiful order, and many a visitor went away better informed upon the subject of the vine culture, than he had been before this visit to Gabriel Sleath.

The Vine Disease.—To my report on the Grape Malady, handed to you in January, I have now the pleasure of showing the plates of the so-called Oidium Tuckeri, described and drawn, in the Botanical Gazette, No. 33, 1853, by H. V. Mohl, Professor of Physiology at the University of Tubinger.

Prof. H. V. Mohl, in his closing report on the Grape Malady, says, in Botanical Gazette, No. 9, March 3, 1854: That the fungus which affects the grape is not an *Oidium* but an Erysiphe, which genus, besides the fruitificating bags, forms on the filaments brood cells, (conidien,) with innumerable seed, at the places where they are hooked to the epidermis. I mentioned these brood cells in my former report.

The Professor closes with the following resolutions:

1. That the vines may grow rapidly in spring, having no sign of disease.

2. That the parasitical fungus appears on the healthy epidermis.

3. That the discoloring and dying of the epidermis is local on the place where the fungus is affixed.

4. That the degeneration of the tissue, on the bark and on the berries, does not reach further than the epidermis and the next layer of cells.

5. The decreased cold does not decompose, but dries up and gives resistance to the mechanical extension of the epidermis.

6. That in consequence of this resistance, the parenchyma of the berries is prevented from extending to its normal size.

7. The berries remain in a half ripe state.

8. That every single berry, of the diseased bunches, which was less affected by the fungus, became perfectly ripe; showing, therefore, clearly, that the non-maturing of the berries does not depend upon a disease of the vines.

L. Rehfuss.

Brooklyn Horticultural Society.

The Brooklyn Horticultural Society has been recently organised, and numbers about four hundred members. The President is John Del Vechio, and the Secretary, Delos W. Beadle. It holds monthly meetings, at which Horticultural subjects are discussed, and flowers and plants exhibited.

The spring exhibition held at the Athenæum, on the 10th, 11th, and 12th inst., was entirely successful. The view from the gallery was strikingly picturesque. In the centre of the room was a fountain, in which was a large *Victoria Regia*; the body of the floor was filled with plants and flowers, bouquets and "clumps of plants." The Speakers' platform was filled also with plants and flowers. At about nine o'clock, P. M., a large tree on the platform was moved to one side, and the Rev. Henry Ward Beecher was introduced to the audience. The trees, and plants, and flowers hung over him, about him, and around him—he came peeping through nature's beauties before his audience—and such an audience! A room completely full—ladies and gentlemen in incessant motion around the beautiful plants and flowers, which smiled on them a welcome.

New York Horticultural Society.

The New York Horticultural Society was re-organised in 1850, and now numbers three hundred members. It has a library of about two hundred and fifty volumes. Shepherd Knapp is President; Peter B. Mead, Secretary; Jacob C. Parsons, Treasurer.

Once each month, "Conversational Meetings," on Horticultural subjects, are held at the rooms of the Free Masons' Hall, 600 Broadway.

Chunnenuggee Horticultural Society.

The Annual Fair was held in the society's gardens, in Macon Co., Alabama. This society is composed of planters, who have secured a garden for trial of fruits and flowers. C. Peabody, Esq., editor of the Soil of the South, had been invited to address them on this occasion.

The Orchard.—No. 3.

SUMMER PRUNING.

The leading topic of this paper has been styled summer pruning—but it may include all pruning—for I am satisfied that this important operation should be chiefly performed during the growing season of the year, whether the cutting be done in the nursery, or in the orchard, or lawn. Many persons are opposed to all pruning, while others are ever itching for an opportunity to exert their muscles, and use their implements upon every luckless tree and shrub that may chance to fall in their way. Both extremes are erroneous. The best course, as is usually the case, lies in the mean. Let us inquire what are the objects of pruning.

The great objects of this operation are to thin out a redundance of growth, and to remove dead branches when any such may be found; besides this, much may be done by judicious trimming, to form the head of the tree; indeed, many judicious orchardists confine their labors almost exclusively to the young tree, directing the limbs and future form of the tree from the first, and they claim that if sufficient care be exercised at first, that nearly all after-trimming may be dispensed with. This, however, will require the most watchful care and excellent judgment to insure success. The trimmer must see before him the whole contour of the future tree, and will be obliged to regulate the first efforts of the embryo bush before him, so as to force its future progress into the direction he desires it should assume. Thus, beginning with the first summer's growth of the graft or bud in the nursery, if the object be to grow whip-stalks—tall, smooth, and straight, all the energy of the plant should be compelled to seek an upward growth without branching, and the next season these must not be shortened-in, but the top bud should be encouraged to break into another single leader. If, on the contrary, stocky, firm, and low branched trees be desired, and the increasing intelligence of planters is inducing them to seek such stout and well-furnished trees, rather than those which are measured, estimated, and sold by the yard;—if, I say, you desire to produce stocky trees, it will be well to stop the leader, by cutting or pinching-in, within a few inches, and this, in rapid growing sorts, may be done during the first growing season; indeed, quite early, so that the lateral buds may be developed, and healthy side shoots will be forced out in time to mature perfectly before frost. In the peach, the young shoot may be pinched-in early in May, or when it has grown but a few inches—the result will be a division of the head into several leaders. By means of this division, it is true, the trees will not be so nice and tall in the autumn, nor will they pack in such nice bundles as those which have been crowded together and grown up without any shortening, but for the amateur, or judicious orchardist, who may desire to form low heads to his trees, they possess the great advantage of being already started in the right direction. With the apple, which is seldom desired to branch low, this is a matter of less consequence, as the trees will generally branch low enough the second season; but with dwarf pears, for pyramids, and in this climate with cherries also, which are much better with low heads, it is very desirable to encourage this result, during the first summer of their growth, by pinching-in the shoot as here suggested. Should this season have been neglected, or by preference passed over, the result may be accomplished in the next year by cutting back severely in the winter or spring; here, however, is a great loss of growth, nor will the side branches be so well developed, nor so evenly distributed, as where the main shoot has been stopped the previous year. In a vigorous shoot, especially, the upward tendency is so predominant, that the majority of the lower buds are slightly developed, while those near the summit or termination, are full and plump, and are ready with the opening spring to burst early, and thus maintain the supremacy of upward growth, and the lower buds will chiefly lie dormant. If, however, the shoot had been stopped or pinched-in before the growing season had passed, the vitality would have been distributed among the buds, which would thus be swollen and prepared to produce lateral branches the next season, if not at once. This principle is well understood in pinching, to produce fruit spurs and buds in trees of more advanced age. Now, if the growing season has been allowed to pass without

paying any attention to the vigorous shoots of young trees that it is desired to force into side branches, much may yet be done, even during the fall and winter, toward preparing it for a severe heading-in on the following spring, for there is activity in the buds, even during the dormant season; a partial shortening at any time during this period will induce the development of the lower buds, which will be prepared to break, in due season, if the tree needs to be severely cut in the spring to force out lateral branches. If not thus prepared, the blind eyes or buds will not start with the rest of the tree. Advantage may be taken of this fact in the pruning of some ornamental shrubbery—particularly some of the Roses—the season of bloom may thus be prolonged considerably; by leaving one plant in a natural condition, untrimmed—the terminal, slender branches of which will be found first to offer their blossoms; another trimmed to half its length of shoots, and cut in the autumn, will follow next in the period of bloom, while a third, cut back very severely, late in the winter or spring, will be obliged to push the dormant buds, and instead of blooming on the first of June, its natural period, has been observed in flower as late as the middle of July. Severe root-pruning, or transplanting, may also be named here incidentally, as another means of retarding vegetation.

The best and most concise rules and principles of pruning, being a summing up of all that has been written, are the following postulates of Dubreuil, a French writer, which Mr. Barry has made accessible to American readers, through his excellent book, "The Fruit Garden:"

"The theory of the pruning of fruit trees rests on the following six general principles:

"1. *The vigor of a tree, subjected to pruning, depends, in a great measure, on the equal distribution of sap in all its branches.*

"In fruit trees abandoned to themselves, the sap is equally distributed in the different parts without any other aid than nature, because the tree assumes the form most in harmony with the natural tendency of the sap.*

"But in those submitted to pruning, it is different; the forms imposed on them, such as espalier, pyramid, vase, &c., change, more or less, the normal direction of the sap, and prevent it from taking the form proper to its species. Thus nearly all the forms given to trees require the development of ramifications, more or less numerous, and of greater or less dimensions at the base of the stem. And, as the sap tends by preference toward the summit of the tree, it happens that, unless great care be taken, the branches at the base become feeble, and finally dry up, and the form intended to be obtained, disappears, to be replaced by the natural form, that is, a stem or a trunk with a branching head. It is then indispensable, if we wish to preserve the form we impose on trees, to employ certain means, by the aid of which the natural direction of the sap can be changed and directed toward the points where we wish to obtain the most vigorous growth. To do this, we must arrest vegetation in the parts to which the sap is carried in too great abundance, and, on the contrary, favor the parts that do not receive enough. To accomplish this, the following means must be successively employed:

"1. *Prune the branches of the most vigorous parts very short, and those of the weak parts long.* We know that the sap is attracted by the leaves. The removal of a large number of wood-buds from the vigorous parts, deprives these parts of the leaves which these buds would have produced; consequently, the sap is attracted there in less quantities, and the growth thereby diminished. The feeble parts being pruned long, present a great number of buds, which produce a large surface of leaves, and these attract the sap, and acquire a vigorous growth. This principle holds good in all trees, under whatever form they may be conducted.

"2. *Leave a large quantity of fruit on the strong part, and remove the whole or greater part from the feeble.* We know already that the fruit has the property of attracting to it the sap from the roots, and of employing it entirely to its own growth. The necessary result of this is, what we are about to point out, viz., that all the sap which arrives in the strong parts, will be absorbed by the fruit, and the wood there, in consequence, will make but little growth, while on the feeble parts, deprived of fruit, the sap will all be appropriated by the growing parts, and they will increase in size and strength.

"3. *Bend the strong parts and keep the weak erect.* The more erect the branches and stem are, the greater will be the flow of sap to the growing parts; hence, the feeble parts being erect, attract much more sap than the strong parts inclined, and, consequently, make a more vigorous growth, and soon recover their balance. This remedy is more especially applied to espalier trees.

*This is not in all cases true. Peach-trees, we know, left to themselves, exhibit a very striking example of the unequal distribution of the sap. The ends of the branches attract nearly the whole, leaving the lateral shoots and lower parts to die out. In other species, similar instances might be quoted, and, as a general thing, the proposition is unsound, except in a comparative sense.—*Elliott.*

"4. *Remove from the vigorous parts the superfluous shoots as early in the season as possible, and from the feeble parts as late as possible.* The fewer the number of young shoots there are on a branch, the fewer there are of leaves, and consequently, the less is the sap attracted there. Hence, in leaving the young shoots on the feeble parts, their leaves attract the sap there, and induce a vigorous growth.

"5. *Pinch early the soft extremities of the shoots on the vigorous parts, and as late as possible on the feeble parts, excepting always any shoots which may be too vigorous for their position.* By thus pinching early the strong parts, the flow of sap to such points is checked, and naturally to the growing parts that have not been pinched; this remedy is applicable to trees in all forms.

"6. *Lay in the strong shoots on the trellis early, and leave the feebler parts loose as long as possible.* Laying in the strong parts obstructs the circulation of the sap in them, and, consequently, favors the weak parts that are loose. This is only applicable to espaliers.

"7. *In espalier trees, giving the feeble parts the benefit of the light, and confining the strong parts more in the shade, restores a balance,* for light is the agent which enables leaves to perform their functions and their actions on the roots, and the parts receiving the greater proportion of it acquire the most vigorous development.

"2. *The sap acts with greater force and produces more vigorous growth on a branch pruned short, than on one pruned long.* This is easily explained. The sap acting on two buds must evidently produce a greater development of wood on them, than if it were divided between fifteen or twenty buds.

"It follows from this, that if we wish to obtain wood branches, we prune short, for vigorous shoots produce few fruit buds. On the contrary, if we wish to obtain fruit branches, we prune long, because the most slender or feeble shoots are the most disposed to fruit.

"Another application of this principle is to prune short, for a year or two, such trees or parts as have become enfeebled by overbearing. (This principle deserves especial attention, as its application is of great importance).

"3. *The sap tending always to the extremities of the shoots causes the terminal bud to push with greater vigor than the laterals.* According to this principle, when we wish a prolongment of a stem or branch, we should prune to a vigorous wood-bud, and leave no production that can interfere with the action of the sap on it.

"4. *The more the sap is obstructed in its circulation, the more likely it will be to produce fruit buds.* This principle is founded on a fact to which we have already had occasion to refer, viz.—that the sap circulating slowly is subjected to a more complete elaboration in the tissues of the tree, and becomes better adapted to the formation of fruit buds.

"This principle can be applied to produce the following result: when we wish to produce fruit buds on a branch, we prevent a free circulation of the sap by bending the branches, or by making annular or circular incisions on it; and on the contrary, when we wish to change a fruit branch into a wood branch, we give it a vertical position, or prune it to two or three buds, on which we concentrate the action of the sap, and thus induce their vigorous development.

"5. *The leaves serve to prepare the sap absorbed by the roots for the nourishment of the tree, and aid the formation of buds on the shoots. All trees, therefore, deprived of their leaves are liable to perish.* This principle shows how dangerous it is to remove a large quantity of leaves from trees, under the pretext of aiding the growth or ripening of fruits, for the leaves are the nourishing organs, and the trees deprived of them can not continue to grow, neither can the fruit; and the branches so stripped will have feeble, ill-formed buds, which will, the following year, produce a weak and sickly growth.

"6. *Where the buds of any shoot or branch do not develop before the age of two years, they can only be forced into activity by a very close pruning, and in some cases, as the peach, this even will often fail.* This last principle shows the importance of pruning the main branches of espaliers particularly, so as to insure the development of the buds of their successive sections, and to preserve the side shoots thus produced, for without this, the interior of the tree will become naked and unproductive, and a remedy will be very difficult.

"If these principles and practices of pruning be carefully studied in connection with the habits of growth and bearing of the different fruit trees, pruning will be comparatively an easy matter. The mode of obtaining any particular form or character can not fail to be perfectly plain and simple; yet no one need hope to accomplish, in all things, the precise results aimed at, for even the most skillful operator is sometimes disappointed; but those who give constant attention to their trees, will always discover a failure in time to apply a remedy."

Now with all these rules, concise and yet particular as they are, will it be a difficult affair to produce the desired result in the most perfect shape and development of the tree-head, the curbing of straggling leaders of rank growth and the production of prolific fruit spurs—surely not, the novice will be disposed to reply. Alas! the theory may be most perfect, it may be thoroughly studied and well understood, but an anticipative

imagination and great practical experience will not always be able to direct the growth of limbs, nor to prevent or foresee the accidents that will occur to mar the result.

When a branch is to be shortened for the sake of producing symmetry, by filling up a gap with a new limb, the trimmer should so direct the cut as to leave a fine prominent bud near the incision and looking toward the part to be supplied with twigs and foliage. The under side should generally be preferred as the position of the bud when shortening for a lateral branch for the production of fruit spurs, because it is less apt to break vigorously and produce a strong shoot. If the gap occur on either side of the limb that is trimmed, select a good bud on that side and cut back to it, as it will probably shoot out strongly and compensate the deficiency in that direction. Much may also be done towards restoring the balance of a tree by a little management of the young limbs, separating some, and approximating others by the use of ties, but it is best to commence the management in the infancy of the tree, even in the nursery, but especially in the orchard—and there selecting the best shoots, and directing them in such a manner that they shall, from the first, grow appropriately into the future divisions or branches of the tree. The treatment will, of course, vary with the object had in view, whether it be to produce espaliers, pyramids, quenouilles, or other forms which fancy may direct, each of which would require minute details and directions for their management, but will not be treated of in this place, since the treatment of the orchard is under discussion, rather than that of the fruit-garden, or lawn.

Low-headed trees are, on many accounts, to be preferred in our climate, even for the apple, the great orchard fruit. These should have their training commenced in the nursery, but it is seldom there attempted, on account of the desire with most purchasers to see tall trees: often mere whip-stalks, trimmed up clean and straight, will sell more readily than stout, stocky young trees containing every element of future beauty and usefulness. Always select such when it be possible, remembering that we have already agreed that the ground planted in fruit should not be appropriated to pasturage, and hence the tall stems are not needed to keep the fruit and foliage up out of the reach of cattle.

Having selected properly grown trees and planted and tended them as already advised, the summer pruning for the first few years becomes a matter of great importance. A frequent examination of their condition should be made during the growing season, and with good judgment and small sacrifice of wood, great good may be effected. This should consist in stopping rambling or rampant shoots, either by pinching their buds with the thumb and finger, or cutting them back with the knife; here, however, is the point to exercise great judgment. In branching the tree it should be an object, from the first, to divide the head among more than two main limbs, since the division into only two is more apt to be followed by injury from splitting in after years, from the weight of the fruit and foliage, than when the strain is more divided.

To Destroy Snails.

And why should they be destroyed? Because they destroy your plants. I have seen two-thirds of the seedling flowers of various kinds, in a small garden, entirely killed by them in a few days. The slug, *Limax agrestis*, which is without a shell, is the most destructive, perhaps, because most common. They suck the juices of the young plants, breaking the epidermis and fiber to get at it; consuming the latter, also, to considerable extent. Besides which, the slime they smear over the young shoots and leaves is pernicious, causing sloughing and decay.

Lime water, it is well known, will destroy them, but, perhaps, not so speedily and effectually as an aqueous solution of the common alkalies, potash and soda, especially the former. A tea-spoonful of strong ammonia, or caustic potash, in a quart of rain-water, makes a solution sufficiently energetic to insure the destruction of as many snails as it is put upon. Common ash-lye will be found about as efficient, and more economical, when the territory to be washed with it is large. It need not be strong enough to be of the slightest injury to plants. Snails will be found harboring under chips, stones, and leaves. Expose them by turning these over, and pour upon them a small quantity of either of the solutions named. J. W. W.

Influence of Light upon Vegetation.—No. 3.

HEATHS AND ORANGES.

Having now directed the attention of our readers to the influence of light upon the plants which are usually cultivated in the stove, as also upon those which are termed "succulent plants;" and having from the varied effect of such influence therein demonstrated, deduced a few practical inferences with regard to the culture and management of the more important members of these sections, we propose taking into consideration the effect of different degrees of light on the various tribes of green-house plants, and endeavoring to show how such plants may be improved and cultivated to greater perfection by the application of a correct knowledge of sound physiological principles, and the examination and investigation of their natural habits in this respect.

As we intend upon the present occasion to treat this subject solely as a practical question, we proceed at once to the matter under consideration; and will premise by stating, that in the term "green-house plants," we include heaths, orange-trees, camelias, pelargoniums, and miscellaneous plants requiring the protection of the green-house; upon which five divisions we propose offering a few separate remarks, not, however, upon the whole system of their cultivation, but solely with reference to the subject now before us. There is perhaps no genus or tribe of plants in the whole vegetable kingdom, the cultivation of which is apparently attended with such great difficulty, and in which such numerous failures are constantly experienced, as the genus Erica; and although some eminent cultivators, who have written on the subject, deny that there is any difficulty in growing the plants of this beautiful genus, the very fact of their considering it necessary to lay down such a number of specific rules for their management, supplies their own confutation of such a statement. The difficulty, therefore, in cultivating heaths, as indeed any other plants, ceases to exist only when their particular habits are correctly known, and until this information is acquired, it is vain to think of growing them to perfection. The ill success which is so frequently experienced, is in a great measure attributable to the use of improper soil, to unskillful potting, and injudicious watering; but we imagine that one ordinary and cogent cause is the want of due attention to the influence which solar light possesses or exercises upon them. Every person who cultivates a collection of heaths, or even only a few species of them, must have had the mortification of witnessing some of his plants wither and die during the summer season, notwithstanding he had administered water to them three or four times in the course of a day. It becomes, then, a question of great interest with the cultivator, how this lamentable catastrophe may be averted: and some may be ready to ask, will not placing the plants at a greater distance from the glass, and admitting a free circulation of air by ventilation, preserve them from this sudden destruction?—to which we answer, that the former of these practices is manifestly injudicious, being productive of great injury to the plants in dull weather, by causing them to become drawn and weakly, and consequently rendering them still more tender and susceptible of injury from the sun's influences: while the latter method has been proved to be wholly ineffectual, as we (and we doubt not many other cultivators) have lost specimens of our most beautiful species in a hot summer's day, although the house in which they were kept was ventilated in the most perfect manner possible. This is no doubt the effect of the vehemence of the sun's beams causing such rapid and excessive evaporation, that the functions of the plant are deranged or impaired to such an extent as to be unable to maintain the vital principle.

We are not prepared to define the connection between solar light and heat, nor to distinguish the influence of the former from the latter upon plants: it must be apparent to our readers that heat is so intimately concurrent with the immediate light of the sun, that, for practical purposes, it is impossible to consider them apart. We shall be excused, therefore, if in this article on "light" we appear to confound it with "heat." Solar heat and light are such invariable concomitants, that the means employed to mitigate the one, will necessarily in some degree diminish the other; indeed, when treating of light, we may be understood to include its inseparable associate—solar heat.

From the foregoing demonstration of the powerful and injurious influence which the sun's rays exert on the various species of Erica, it is palpable that they should never be placed indiscriminately amongst other plants which require a great degree of solar light, but should always be cultivated in a house by themselves; and we are sure that no individual will deny that they are eminently worthy of this distinction, as well as of every care and attention that can be bestowed upon them. We are aware that some of the best heath cultivators have already practiced this system, but we are anxious to see it more extensively adopted; and what we now wish especially to enforce, as one of the most important advantages that may be derived from such a system, and as the result of our present inquiry into this subject, is the necessity of shading the house with thin canvas during the heat of the day in the summer months. This canvas should be so placed that it may be rolled on or off the house at pleasure, and it should always be removed when the sun is not shining too fiercely, as it is only a great intensity of solar light which injures these plants, and they should never be secluded from light when the sun is not shining.

It is the necessity and propriety of shading which we have all along had in view in speaking of these plants, and to this we again earnestly urge the attention of our readers. It is true that some few of the species of this genus are found in situations where they are exposed to great drought, caused by the intensity of the sun's rays during a brief portion of the year; but it should not be forgotten that many of these grow naturally in a *loamy soil*, which every one will admit is more retentive of moisture than that in which we usually place them. And, again,—others that inhabit exposed localities, grow in mountainous districts, or even in the clefts of rocks, in which case their roots are supplied with moisture from the portions of rock which surround them, as these constantly retain a greater or less degree of it. Besides, who will attempt to argue that a plant, the roots of which are confined in a pot, and that pot, as well as the surface of the small portion of soil it contains, exposed to the full action or influence of the sun—is not more liable to injury from exhausting evaporation, than one in a situation where only the surface of the soil in which it is growing is exposed, and where it must likewise always receive some moisture by absorption from the subsoil? No one, we feel assured, can for a moment entertain such an opinion, much less endeavor to support it. Therefore, admitting that certain species of this genus are found in those localities where they are occasionally subjected to a great degree of solar light and heat, and consequently of drought, we maintain that even in such situations they possess great advantages over those which are kept in our green-houses, enjoying counteracting influences which the latter do not, and are thus enabled to endure the full blaze of a summer's sun. But it is notorious that the majority of them are met with in more or less shaded positions; and this proves that we are not deviating from nature's treatment in proposing an artificial shading for them in those purely artificial situations and unnatural circumstances under which they are here cultivated. Indeed, we confess that we should not scruple to depart from the precepts of nature, where, owing to the adventitious and foreign influences to which they are necessarily subjected, a system of treatment could be found more congenial to the habits of natural productions when under artificial cultivation; but where that system has not and can not be ascertained, (which is the case with most, we do not say all plants,) we deem it advisable and expedient to adhere as strictly as possible to the course prescribed by nature; and when by experiment and investigation other systems are found to be more suitable, we shall willingly and gladly adopt them.

We therefore again repeat, that every person who is desirous of making an advancement in the cultivation of heaths, should have them collected into one house, placed at a slight distance from the glass, and shaded from the scorching rays of the summer sun. By this latter mode of treatment, the plants will not only be preserved from sudden destruction by the fierce rays of the sun, but the generation of mildew, which is well known to prove fatal to heaths, will be in a great measure prevented. Most practical writers on the subject of heath-culture, agree in ascribing the production of mildew on these plants to the effect of the too-powerful rays of the summer's sun; and it is recommended to place the more delicate sorts

in a frame during the summer season, the lights of which are glazed with green glass; removing the latter entirely when the sun is not shining. This practice, however, is far more expensive, and certainly not more effectual, than that of shading the house in which the plants are kept, for the lights would be entirely useless in the winter season; the plants likewise would not be exhibited to advantage in such a situation; and we reiterate our opinion, that shading is not only a useful and important feature, but the most preferable mode that can be pursued, in the cultivation of heaths.

Passing on to the consideration of the effect of light on orange-trees, we find ourselves involved in a curious and somewhat intricate inquiry. No person who has witnessed the orange houses of this country, which have been built for the professed and almost exclusive purpose of cultivating orange-trees, but must have been impressed with the notion that these plants are impatient of light, and incapable of enduring a great degree of it. With massive walls of brick or stone, on the southern side of which a few windows are generally introduced, and the only other light that can be admitted being conveyed through the roof, which is certainly sometimes glazed, but elevated to an immense hight, our orangeries have more the appearance of gloomy prisons, than repositories for plants. The general heavy character of these structures must appear the more extraordinary to the casual observer, from the circumstance of most cultivators exposing their plants to the open air during that period of the year in which solar light is the most powerful, and its action much more continued, and confining them in these dull and dark conservatories when light is so much diminished by natural causes. These apparent discrepancies we must confess we are at a loss to reconcile, but there does appear to us to be a propriety in not subjecting orange-trees to too great a degree of solar light, at all seasons of the year; though we think that most cultivators have erred in carrying this principle to the extreme in their construction of houses for the reception of these plants.

Where orange-trees are cultivated solely for the production of fruit which can be applied to edible purposes, there can be little doubt that full exposure to light, at all periods of their growth, is a most important point to be attended to; but such is by no means the object of the cultivators of this country, and if it were, is not likely to be attained to an extent sufficient to compensate the grower. It is the appearance of the plants—both of the foliage and fruit, for which alone they can be esteemed in our collections; and to preserve the former in a healthy and luxuriant state, and at the same time to ensure a profusion of the latter, either too great or too limited a degree of solar light would not only be found injudicious, but seriously prejudicial. Instead, therefore, of adopting either or both of these extremes, the latter of which, as before remarked, is the usual course pursued by cultivators, we consider that the object of the grower would be much more fully attained, were the houses intended for orange-trees constructed so as to admit a greater degree of light, and the plants retained in them throughout the whole season. By these means the trees would be maintained in a constant state of luxuriance, without either becoming weak or sickly, (as they almost invariably do in a dark house,) or being subjected to injury by a sudden removal from a confined and partially-shaded situation, to one in which they would be entirely exposed to the full action of the sun's rays.

Autumn.

But there is as much life in autumn as death, and as much creation and growth as passing away. Every flower has left its house full of seeds. No leaf has dropped till a bud was born to it. Already another bough is hidden along the boughs—another summer is secure among the declining flowers. Along the banks of the green, heart-shaped leaves of the violet tell that it is all well at the root, and turning the soil I find those spring beauties that died, are only sleeping. Heart, take courage! What the heart has once owned it shall never lose. There is a resurrection hope, not alone in the sepulcher of Christ; but, as that sepulcher was in a garden, so every flower, and every tree, and every root, are annual prophets sent to affirm the future, and cheer the way. Thus as birds, to teach their little ones to fly, do fly first themselves and show the way, so the year and all its mighty multitudes of growths walk in and out before us, to encourage our faith of life by death—of decaying for the sake of better growth.

H. W. BEECHER.

Solar Heat.—No. 3.

TRANSPIRATION.

Climatic differences of temperature, independently of exercising a most important influence on the geographical assignation of plants, essentially affect the various phenomena of their functions, as is illustrated and exhibited in their growth and products. That heat is indispensable to the excitation of vegetable life, is sufficiently attested by the fact, that those members of plants which remain exposed to the chilling atmosphere, are invariably torpid during the winter seasons, and although fluids are absorbed from the earth, throughout even the severest winters, it is only by those roots which are far enough removed from the surface to enjoy the degree of temperature necessary for rarefaction, and they can circulate only through those parts which are duly preserved from radiation by the bark.

Vitality itself,—that mysterious principle,—though apparently an inherent property of vegetation, is dependent on heat for its continued existence. The power of, and proneness to procreation, may likewise be supposed to increase in the same ratio as the temperature; for, in those countries where the highest temperature prevails, plants are met with in greatest abundance; while, in proportion as the degree of latitude increases, vegetation is propagated much less profusely, and, as far as the researches of man can determine, disappears entirely on approaching the poles. Changes of temperature affect the substance and functions of plants in various ways; but in none is their influence so conspicuous as in the expansion, extension, and dissolution of their structure. Development and decomposition are alike the consequences of heat, and vary in their progress and extent in precise accordance with the existing degree of temperature. It is the former of these that we propose now to explain. A moderate temperature will cause a gradual elongation and enlargement of all living vegetable substances, by inducing the imbibition and circulation of nutritive fluids. By a considerable elevation of this temperature, for any length of time, results of a directly contrary nature are experienced, and a perceptible contraction occurs. This is caused by excessive evaporation, which expends too prodigally the vital juices, impoverishes the plant, and thus collapses its tissue. Heat incites the functions of all kind of plants in the same manner, though by no means in an equal degree. The axiom that "habit is second nature," applies not more truly and appropriately to man than to vegetation. By long-continued habit, the faculties of all plants are so conformed and adapted to their native climate, that removal to countries of a much higher or lower temperature, is always highly detrimental, and frequently fatal. It is possible, however, to effect a change in their habits, and nothing but perseverance in a judicious course of treatment is required to compass this end. Where the change is from a colder to a warmer climate, this is especially practicable. Plants, like animals, are supposed specifically to possess a distinct and definite constitution, requiring either particular kinds of food, or that their nutriment shall be attempered, prepared, and transmitted in and by particular modes and media. This is certainly characteristic of some species; but, applied generally, it appears far from accurate. The majority of plants exhibit the same radical organization, have correspondent functions, and are regulated in the exercise of those functions by the same agents. Of these agents, heat exercises the most extensive and manifest jurisdiction. Indeed, so influential is its operation, that vegetation must either adapt itself to its various modifications, or become extinct. To afford a clear view of the offices and effects of heat on the functions of plants, it will be necessary to trace its agency through the different stages of their growth. The circulation of fluids, the accretion and secretion of new matter, and the process of evaporation, are all mainly referable to the action of solar heat. From the time of the first expansion of their seed-lobes, to the period when their fruit and seeds attain their utmost perfection, none of the above particulars can be accomplished unless the temperature is sufficiently high. Heat is material, indeed essential, to the germination of all descriptions of seeds; and when we consider that moisture and air, (the other necessary concomitants toward inducing this process,) are generated, or reduced to a proper rarity of consistence, almost entirely

by this agent, we shall perceive that heat is principally instrumental in producing this first and most important of vegetable metamorphoses. No sooner does the vital lymph begin to flow, and the seed leaves appear above the surface of the ground, than another evidence of the influence of heat is elicited. A system of transpiration commences from their surface, which increases as the plant progresses, and the leaves are formed; this being the means whereby the superfluous moisture imbibed from the soil is evolved, and the plant preserved from turgidity, with its inevitable consequence—disease. In the incipient vegetation of the seeds, as well as in the subsequent enlargement of the plant, accretions are continually added to its substance, in the form of new strata, or elaborations of matter, similar in character and arrangement to those which constituted its original organization. These additions, whether longitudinal or horizontal, internal or exterior, are the result of the propulsion of fluids from the soil by heat. The secreted deposits by which they are afterward surrounded and consolidated, are occasioned principally by the action of light upon the surface beneath which the circulating fluids are spread; but partly, also, by the external agency of heat, which operates upon those fluids through the medium of the pores, and abstracts their more aqueous constituents by exhalation.

Botanists almost unanimously admit the existence of pores in the cuticular membranes of plants, although some deny their visibility. These pores are orifices of various sizes, extremely diverse in number in different plants, provided for the effluence of redundant moisture, and perhaps, also, for the inhalation of genial gases, or the dissipation of impalpable excrement. The transpiration of fluid, of gas, or of caloric, appears to be their principal office, as plants seldom absorb nutriment in this manner, unless they fail in obtaining an adequate supply from the soil. Natural evaporation is undoubtedly due to solar heat; and although it is augmented when the plant is subjected to the rays of light, this latter agent can only be regarded as an auxiliary in its promotion, since it proceeds unrestrainedly when a due degree of heat is present, even though the plant be enveloped in total darkness. The effects of this evaporation are somewhat remarkable. In tropical countries it is periodically so profuse, as to suspend the functions of vegetation, and occasion a season of repose. The water which is vaporized during this period, descends again upon plants after a certain time, and causes them to resume their growth with renewed vigor. The vegetation of temperate climes experiences a still greater degree of benefit from this source. Saturated with the fluids absorbed during winter, the genial warmth of the sun in the spring calls these into admirable avail, in the development of stems and foliage; by which, also, it simultaneously provides an immediate exit for their redundant inhalations. As the young branches, too, approach maturity, the higher temperature which prevails at this season, increases the exhalations from their surface to such an extent, as to dry and concrete their newly-formed substance and cuticle; thus enabling them to combat successfully the rigors of the succeeding winter.

Frost is found to be particularly destructive to plants in the spring, after they have commenced growing. This is owing, in a great degree, to the protracted interruption of the process of transpiration, which has preceded that period, and its aggravated suspension when absorption and circulation have been increased. Hence, the newly-formed leaves and shoots, being the media through which this accumulated moisture is exhaled, are so completely charged with it, as to be highly susceptible of injury from cold. The tender, nascent state of the new developments, and the total absence of cuticle, or its amalgamation with the cellular tissue—forming, in fact, a similar aggregation of cells, filled with fluid matters—increase the liability to derangement from such circumstances. To the same source may be traced the frequent detriment which the young shoots of plants receive, on a severe winter succeeding an unusually cold summer and autumn. Being unable to rid themselves of the refuse portion of the moisture they abstract from the soil, without a sufficient stimulus, their parts remain succulent, flexible, and incapable of repelling frost. It would appear from these facts, that water, or any other fluid, radiates heat much more readily than dry and solid substances; and such is really the case; therefore it may be affirmed, as a fundamental

principle in cultivation, that the less moisture a plant is allowed to absorb during the autumnal months, the better will it be prepared to retain its needful temperature through the winter.

Extreme cold is, as stated before, much more injurious to plants in the early stages of their periodical growth; and, as analogy teaches, while experience attests, young trees are generally tender, and particularly pervious to frost; whereas, in proportion as they become older, evaporation is increased, —their tissue is consolidated and protected by a thicker and tenser cuticle—that they are thus rendered far more secure from any danger arising from a decrement of temperature. The tenderness in this instance proceeds from the same cause as that of the newly-formed wood previously noticed, viz., an undue propulsion of fluids into the young shoots, at a period when they are only partially organized, and consequently, when the texture of their vesicles is not sufficiently rigid to resist the pressure of the accumulated sap, during the interruption of the transpiratory process.

Young plants have generally more absorbent superfices on their roots, till these have become fully hardened, than they present relatively to the atmosphere, for insuring the necessary exhalations and concretion; and their supply of fluids is thus much greater than they can dispose of, if at all checked by cold. The short distance at which their roots lie from the surface of the soil, may also be assigned as a reason for their peculiar susceptibility; because, when their rootlets have penetrated to a considerable depth, they are enabled to imbibe fluids from the lower strata, of a much higher temperature than those of the surface, and these, by their ascension, necessarily tend to preserve a due degree of warmth and vitality in the plant. By a parity of reasoning, those plants whose roots extend themselves horizontally, can not possibly be so well prepared for sustaining cold, as others, the roots of which strike downwards in a perpendicular direction.

As a brief account of the manner in which frost operates so inimically on vegetation, can not prove otherwise than interesting, it may here be attempted. The substance of plants is mainly composed of cellular and vascular tissue, the individual vesicles and vessels of which are filled with fluids. By the congelation and consequent expansion of these fluids, the membrane which envelops and confines them, is ruptured, and disorganization is thus effected. The subsequent action of heat upon the parts affected, causes an increase of evaporation commensurate with its intensity; and this, having then nothing to oppose or regulate its progress, continues till decomposition and volatilization are thoroughly completed. Where the degree of frost is very trifling, and no derangement of the organic structure of the plant occurs, there are means of modifying or even counteracting its prejudicial influence. Every gardener is cognizant of the fact, that the external application of cold water to a plant newly frozen, will, in cases where the organization is uninjured, prevent fatal consequences. It is upon the same principle that snow, applied to a frozen member of the human body, restores life and animation. In both cases the vital fluids are congealed and a rapid thaw, such as the action of heat will induce, would have a similar effect to that of a more intense degree of frost, viz., expand too precipitately, and cause a disruption of the membranous covering of the tissue. On the other hand, by immediately washing or sprinkling the frozen part with cold water, the thaw is rendered more gradual, and circulation is afterward recommenced.

There are two important principles in the treatment of plants affected by frost, which should never be forgotten by the cultivator. First, they must not be subjected to a higher temperature till the frost is expelled; and secondly, this expulsion must be effected in the gentlest manner, and by the tardiest means, which can be conceived. To allow the vital fluids of plants to remain congealed for any length of time, is highly dangerous; and to dissolve them too rapidly, is equally so. No restorative, therefore, can be efficient, unless promptly applied; and none is so appropriate as cold water. When this fails, it must not thence be supposed that it is useless, but that the frost had been too violent and destructive to admit of reparation.

Pores, besides fulfilling the office of respirators, are likewise the chief vehicles of the radiation of heat. It has been frequently stated that radiation and evaporation are

reciprocally dependent or concurrent; the exhalation of fluids either causing or resulting from a simultaneous effusion of heat. In proof of the former of these positions, it is said that frost is never hurtful to plants, until evaporation has succeeded; and that the abstractions of temperature which accompany such evaporation are mainly productive of the injury. But a more mistaken hypothesis could not possibly be imagined.

We have already described the action of frost upon the structure of vegetation. The increased escape of fluids which follows a renewed application of heat, so far from being the operating cause of the damage sustained, is merely one of its effects, and that by which it is made manifest. Indeed, it is ridiculous to suppose that radiation can be a consequence of evaporation; because external heat, the agent which induces the latter, would evidently repress the former. Nor can it be acknowledged that evaporation accompanies radiation, except in a very trifling degree. For, although it is remarked that dew is formed on the under surface of leaves, it seems to have been forgotten that the vapor of which dew is composed by condensation, has so slight a specific gravity that it is diffused through, and held in suspension by, the atmosphere; and does not therefore necessarily descend perpendicularly, but may be deposited upon a cooler substance, in almost any position. Before we can admit that these processes are simultaneously effected, we must assume that they are produced by the same or coincident agents; a theory wholly at variance with existing facts.

Starch.—Fecula, or starch, says Prof. Orr, has only lately been recorded as existing in the animal kingdom. In vegetable nature it is every where met with. It occurs abundantly in the seeds of the cerealia; in the tubers of tuberiferous roots, as in the potato; in the stems of plants; and in lichens. Starch, by its ready convertibility into soluble forms—such as dextrine and sugar—is well fitted to act important parts in the economy of vegetable nature. It appears to be stored up in the seeds, roots, and pith of plants, to supply materials for some of the most essential vegetable products.

Real and False Beauty in Architecture.

BY J. B. HAMILTON.

If there is one feature which more than another belongs peculiarly to this "go-ahead" age, and to this country, perhaps above all others, it is that of producing, or striving to produce, a *maximum* of effect out of a *minimum* of means. The feeling is allied to that inherent energetic, enterprising, and utilitarian principle which forms the very keystone of our success, and enables us to do in half a century what other countries have taken whole centuries to accomplish. Well would it be if we could use without abusing this faculty. Within bounds, and properly applied—especially when successful—nothing can be better than this telegraphic system of arriving at results: but there are cases in which it *can not* be applied—cases in which, like pearls in the oyster, our very treasures prove to be diseases; and this is essentially so, when we attempt to apply this go-ahead principle to architecture.

The attempt to arrive at grand results with incommensurate means, is sure to end in disappointment and absurdity. When we think ourselves most sublime, we are simply making ourselves ridiculous; when we imagine the world delighted and envious, it is only laughing at us.

By way of illustrating this mushroom cultivation of the Fine Arts, this confounding of real and false beauty, let us before going into the country to discuss Rural Architecture, pause to take a glance at one of the many instances in which we have lamentably failed in this city, and done a *great deal badly*, by not being content to do *a little well*. Look at this church close by, with its tall ambitious spire and gorgeous spire-lights, fit handles for such an extinguisher. A thing of such pretensions must surely be of stone or other durable material. Not a bit of it. It is a mere compilation of pine boards, stuck together and painted to look like stone. Its grandeur, like that of a hickory pole, consists in being tall and slender; its boast is, that one out of a thousand may mistake it for what it is not. Miserable deception! paltry contrivance! Had the money squandered upon so much meaningless and perishable pretence, been expended upon the honest and truthful

beautifying of the body of the church, how far more satisfactory and noble might have been the result! Instead of a huge and unsightly pile of brick work, the walls could have been of a well-wrought and neatly-pointed rubble stone work, the windows filled with beautiful flowing tracery and stained glass—the roof of splendid open timber work. But then there would have been no spire! What then? Better no spire at all, than a caricature of one. Far better attempt less and do it well at once, or put on a temporary covering, and leave the work to future taste and liberality. Cologne cathedral, one of the most gorgeous structures ever raised by human hands, had a few years ago on the top of its unfinished tower, the worm-eaten crane for raising stones precisely as the workmen had left it ages before. They had gone as far as they could in their glorious occupation; and that solitary timber, in its mute appeal, was far more instructive and beautiful to the eye of taste, than a thousand wooden steeples in all their flaunting mockery.

It is one of the characteristics of the human mind to revolt at transparent deception; and, for any beautiful object to please us permanently, it must be truthful. Gaudy tinsel, affecting the appearance of gold; ignorant and vulgar wealth usurping the arena of true refinement; the meretricious contents of a rouge box upon the haggard cheek of age, are all things which instinctively disgust us. The same is felt when we look upon a building which is unreal, and the sensation is less intense only because the deception is more harmless in its character. It is this want of truthfulness which mars the effect entirely of so many residences throughout the country, especially those which from the limited means employed in erecting them, can scarcely aspire to be more than what are termed *cottages*. If people about to build country residences, would only determine beforehand what they require, and then adhere to it; resolve that whatever is done, shall be accomplished in a *good*, *solid*, and *truthful* manner; that a cottage shall be simply a cottage, and not ape the pretensions of a *villa*, they would find themselves in possession of objects far more beautiful and interesting than the gaudy things they frequently possess. A few coarse uneducated minds will, doubtless, in passing, think such productions very stylish, pretty, *fashionable*, or whatever they like to call them; but there is not one man of cultivated taste and genuine refinement, but looks upon it with supreme contempt.

There is nothing so unsatisfactory as the barefaced attempt, so common among us, of trying to make things look like what they are not. It is labor utterly thrown away; for the world, without troubling its head much about the matter, is really more capable of appreciating a good or bad thing in architecture, when actually contrasted, than some people seem to imagine. The simplest cottage is as capable of its own peculiar ornaments as the richest villa; and though not able to cope with the latter in splendor, is capable, by tasteful adaptation, of leaving as pleasing an impression on the mind as many a building of far greater pretensions.

Look at this little cottage perched on the hill-side, built of its own native stone, surrounded by its own tufts of evergreens, neat little lawn of flowers, and backed by stately trees. How ingeniously the approach is managed by rustic steps climbing the hill-side, and by the winding path gradually overcoming the declivity. It appears so natural, so adapted to the locality on which it stands, that one might almost imagine it had grown there spontaneously; and we come to the conclusion that any thing else planted there would not have looked half so well. Now, the secret of this success is manifest enough. The man who built that cottage is a man of sound common sense; one who hates all affectation, who is not desirous of appearing richer than he is, and who withal has no slight appreciation of what is genuinely good and beautiful in art. He is a working-man, who has amassed sufficient to build himself a comfortable little homestead in the neighborhood of town, where he and his family can enjoy that repose, fresh air, and healthy exercise which a town life denies them. It is true, his home is one of no pretensions. Its simple but picturesque outline is devoid of all the white filagree work that makes so many others look like Gothic designs for wedding cakes; but what cares he for that? His little money has *well* accomplished for him all he required, and no more. Being content with small rooms, they are furnished decently. His windows and doors have tasteful little hoods

over them to break the blankness of the exterior. His gables are pointed, because in such a position as his, that form of roof alone is beautiful without any ornament whatever. He has introduced a little bay window, of the simplest character, at one end; but that is really more for use than ornament, for he commands a beautiful and extensive view from that part of the house—which was too tempting to neglect. He has besides, his little rustic veranda of forked branches interlacing each other, and festooned by creepers of his own planting, which put to shame all your architectural flourishes of painted boards. This is a COTTAGE, in the real acceptation of the word. It is a specimen of real beauty in art, though put together of the simplest materials, and the result is bound to be pleasing. Let us now glance at a picture of a different character.

The house a little further on the slope of the hill, is the residence of another working-man, of scarcely more means than he of the cottage we have just described, but one whose character is as plainly stamped upon his house as a dandy's is upon the huge glass breast pin stuck in his cravat. This man's notion of home comfort consists not in studying the convenience of his family and himself, but in making the biggest show before the world that he can. He has money enough to build a snug little cottage, but his wishes are to make this little cottage look as fine as the best villa in the neighborhood; to accomplish in fact what the frog tried to do, when jealous of the ox. For this purpose he determined to have his cottage in the style of a Grecian temple, being rather pleased than otherwise with that style from what he saw of it in the State House, at Columbus. The misfortune, however is, that his house is altogether only some twenty or thirty feet. Never mind; pine boards and a good boss can manage any thing. Up goes the Parthenon of a portico, occupying the whole front, too high to afford any shade, too useless to be christened by any name, and the result is what you see. To increase the effect, he has added an octagon turret at each end, because one would have looked lop-sided; they are of no earthly use, but they looked very grand upon some house he had seen some where, and so he attempted them. Some folks told him if they belonged to any style at all, they were Gothic—but what of that? "Variety is pleasing," is it not?

Another grand notion of this proprietor, is the common one that the front of a house in the country *must* have the front door right in the middle of the principal front, as if a house can not be entered by the side as well. To carry this point—although the ground is so steep as almost to require a ladder for visitors—he has a wide pathway running straight from the entrance to the front door, which is stuck exactly in the middle of the very front that one would think should be left for a view. How people get up to the front door, I would rather imagine than prove. Such a house stands there a cold, uninviting piece of sham and vulgarity. It is uncomfortable to its inmates, unpleasant to beholders, costly in its uselessness, and good for nothing but to stand as a scarecrow of warning to the next proprietor who may wish to build upon the adjoining lot.

Grafting Wax.

New recipes are continually being published for the making of grafting wax; but after an experience of several years, we find nothing to equal the Sculptor's Wax, the recipe for which we have before published. It is made by melting together equal weights of bees-wax and Canada balsam, or balsam of fir, with a little vermilion or other coloring matter.

It varies from all other grafting wax in the following particulars. It will adhere to a previously wetted surface, and secondly is not forced off by slight exudations of moisture or sap. It will not run by the sun's heat in summer, nor will it crack in winter; by varying the quantity of balsam it may be made hard or soft, as may be desired by the operator.

When much grafting is to be done, this wax should be placed in the inner pot of a glue kettle, the outer vessel containing oil, salt water, or any other fluid requiring a high temperature to boil it. The wax in the kettle may thus be kept fluid for many hours. It may also be poured out on a sheet of paper and cut in strips to be wrapped around grafts, etc.

This wax may be used so thinly as not to interfere with the closing or growth of the bark, and at the same time is sufficiently elastic for a long distance before breaking. The wax used by sculptors for modeling is of this kind.—*Working Farmer.*

Fences.

The following is a condensed report of the remarks made at the Farmer's Club, on the subject of FENCES, by Professor J. J. Mapes, Editor of the *Working Farmer:*

Before the commencement of the meeting I looked over an abstract of the Census, and arrived at a few important facts in relation to the subject now under consideration. I find by the last Census that we had of improved land in the United States, upwards of 118,000,000 of acres; and if we suppose this to be made up into lots of twenty acres each, we should then require, at fifty cents a rod, which may be supposed to be below the average cost, for labor and making of fences, including of course the cost of preparation, a sum of $113 25 for every twenty acres—and at this cost the fencing of the United States, or rather that portion recognized as improved, and operated as farms, would cost $670,776,273. If there be any mistake in these figures, it results from the Census, either as to the number of acres, or in the estimate of fifty cents a rod.

No subject is more worthy of the close investigation of this club, than the proper style of fences to be used by our farmers. It is well known that no one kind of fence is suited to all parts of the country. For the extensive farms of the west, many of the hedge plants may be used with profit, and indeed, wherever the price of land for twelve feet wide on each of a hedge is materially less than the cost of a permanent fence, there, and there alone, hedges may be used with profit; for without question any hedge which is equal to a permanent fence, protecting crops from the ravages of cattle, will absorb the energy of the soil and prevent its use for crop-growing. It is true that many hedges may be grown on much less spaces, but they are not fully efficient for the purposes intended.

Among the most efficient of these hedges is the Osage Orange, and in many latitudes it may be used with propriety. A proper cutting plow may be used on each side of this hedge to root-prune it, and thus it may be prevented from occupying any greater width of land than practice will show to be necessary for its sustenance.

An excess of fences is the prevailing sin of American farmers. In Belgium, and many other parts of Europe, fences are unknown; and I am happy to say that in many parts of our country the better class of farmers use fences only as the outer boundary of their farms; and where their cattle are soiled, and not pastured, intervening fences are unnecessary.

The amount of land thrown to waste throughout the United States, adjacent to fences, is more than equal to the number of arable acres in some of the smaller states. The cost of useless fences throughout the country, at least of such fences as might be dispensed with, if cattle were soiled, is greater than the value of all the cattle held for working purposes.

It is a common error for farmers to suppose that they are legally bound to put up fences to protect their crops from their neighbor's cattle. It is not so. In most of our states every farmer has a right, if he pleases, to leave his land without fences, and his neighbor is liable for all encroachments made by his cattle upon the unfenced farm. Fences, therefore, are legally intended to prevent the farmer's own cattle from annoying his neighbor, but no farmer who soils his stock need protect himself from his neighbors' cattle by a fence, and those who turn their cattle on the road, meanly to feed them at the public expense, should be made aware of the fact that they are liable for all damage done to their neighbors by these road-fed cattle; for should they walk into an open gate, even if constantly left open, the owner of the cattle would be liable to all damage perpetrated by them. [It is unfortunately not the case in all parts of the country; even where legal provision is made for estrays, the difficulties attendant are not compensated.]

To return to our subject: many farms are stony, and now sub-soil plowing and under-draining are well understood to be judicious, stone walls as fences may be profitably used. These, when properly built, will last for all time. The first preparation should be to dig a ditch at such depth as will place its lower portion, when again filled, below the freezing point. This may be filled with the smaller classes of stones, even with the surface of the ground, on which the stone wall, composed entirely of the larger pieces, should be placed, and if these be one-half wider at the base, than at the top, and properly laid, it forms the best and most secure farm fence with which we are acquainted, never requiring renewal, and scarcely ever the slightest repair.

Where the supply of stone is insufficient, and such kinds of posts can be procured as are slow to decay, such as cedar, locust, &c., then the posts may be imbedded in a partial wall, and topped by a single rail. In some parts of the country where lands have recently been cleared, the reversed roots of large trees are so combined as to form an efficient fence, and capable of lasting for many years. Such fences are often found in the North and West, and give promise to outlast the present owners of the farms.

But when the fact is remembered, that the fencing of many farms is more than half their value, then the true worth of the stone wall properly built will be readily understood.

It is very doubtful if the national debt of England, large as it is, would equal four times the cost of the farm fences of America.

In all the various kinds of fences where wood forms a principal ingredient, its preparation before use should not be overlooked.

Posts, when turned upside down, will last much longer in the soil than when in their natural position. The valvular arrangement of the capilliary tubes necessary for the growth of the tree is such as to admit moisture to rise, but when turned upside down, as with a reversed post, the moisture of the ground can not rise in the post, and therefore, if the upper end exposed to the weather be partially protected by a conical figure or cap, or a coat of paint, such post will not be continually supplied with moisture as one of the necessary elements for decay; and hence will last in the soil for a greater length of time than when placed in the position in which it originally grew. The speaker then detailed the different methods for extracting sap from wood, or rendering it insoluble in the wood so as to obviate the necessity of its extraction. The Kyanizing of posts, preservation by partial carbonization, the use of chloride of zinc, coal-tar, &c., were fully explained. But as he stated, all these facts had been published in detail in his paper.

Wire-fences seem to have nearly gone out of date. Their continual expansion and contraction during every change of temperature throughout the day, are calculated, either to loosen the post or stretch the wire, and all the intermediate springs that have yet been invented, are found inefficient for use. Wire-fences are very cheap, and may answer the purposes of forerunners to an intended hedge, answering as a protector until the hedge has grown: but by this time the wire will be found to carry the elements of its own destruction.

These remarks, however, do not apply to all kinds of iron-fences. Various kinds have been made, which are found to be excellent in practice, and so constructed as to be readily removed when required. The different patterns of hurdle or single-pannel fences thus made, are much used, and those who pasture cattle, and require to change their pasture ground to different parts of the same field, may use these hurdle fences with profit and convenience.

Many kinds of wooden fences are now being made by machinery, and answer an admirable purpose. A Mr. Stratton, near Troy, manufactures one of these new kinds of fences, at fifty cents per rod. This is a picket-fence, with turned pickets passing through flat rails. For these rails green wood is preferred, and while drying they shrink upon the pickets, forming a stiff pannel. These pannels of sixteen feet long may rest their upper rails on locust posts, with their lower rail slightly entering their sides, or they may be locked together by single long pickets, and placed in the position known as worm fences, so that the lengths can each sustain another length by their position, thus requiring twenty per cent. more length of fence, and occupying a comparatively greater width of ground. Many miles of these kind of fences have been put up by the railroads running from Troy.

From the Cottage Gardener.

Waste Materials.

Although philosophers tell us "that there is no waste," but that all substances, after passing through the various states of solid, fluid, and aeriform, return again after a lapse of time into their original position, to be again transformed as before,—yet, in the humble sphere of practical duty to which many of us are called, it becomes expedient either to accelerate or retreat, as the case may be, this ever-moving change which nature is making; and, consequently, though the philosopher may, in accordance with the laws he lays down for himself, discard the word "waste" from his vocabulary, there are still many minor purposes to which it has a significant meaning; and in horticultural affairs we recognize it in many instances with all its force; for we not unfrequently see the misappropriation of many of the means at the disposal of the operator, but very many not used at all. This state of things, doubtless, arises, in many instances, from the want of the means necessary to accomplish all the mind conceives; but this is not always the case; and as of late a laudable desire has been manifested to become acquainted with common things, a few words on what may appear the very commonest of the common may not be altogether in vain.

In all gardens, or in some obscure place outside of them, there should always be "a rubbish heap," or place to which the refuse matters of a garden are carried, from time to time, as they are produced. This repository of what is deemed unfit for any where else, is, of course, not the fashionable quarter where company delights to linger; but it is not unlikely it may contain what they once admired, in the shape of some overgrown hard-wooded plant, well-trained tree, or other attractive object, but which, after performing the duty allotted to it, is cast away no one cares whither. Now, though it would be hard to persuade a skillful cultivator that a fine specimen *Boronia*, which had graced his stage for many years, until no longer the stubby orderly plant it once was, and was cast away, would rise again from its ashes a better plant than before, this doctrine, though

he would by no means entirely discredit it, yet he has sufficient discernment to comprehend the immense time required to perform this routine, and, consequently, he puts his wits to work to discover if some part of the process can not be turned to profitable account; this is, therefore, done in all those cases where the rubbish and other waste materials are made into some such manure as to impart a something useful to whatever it is applied to. This state of things is what our great agricultural friends have been aiming at for years; "to husband their resources," and allow nothing to be lost; and in some of the best tilled districts of the kingdom, the care and pains taken to secure all waste scrapings from the roads, or ditches, all rubbish left in other quarters, and more especially the liquid substances in the yards and other places which of yore were considered only nuisances, these matters have now taken such a turn that they are no longer called "small;" and, although in gardening affairs it would be unjust to give it so important a feature as it assumes on the farm, yet it deserves more attention than it often receives.

To make the case better understood, we must descend into particulars, and shall begin by supposing the heap on which all kinds of cast-away materials is deposited, is in some out-of-the-way corner. Now the first thing to consider is, what more auxiliary matter can be got together at the cheapest rate. If the situation be a stiff loam, or a clayey one, it affords of itself one of the most useful elements of successful culture for the woody matter, with, probably, the addition of some that could be obtained for the purpose, will furnish a sort of fuel sufficient to burn this obstinate compound into one of the most friable and useful ingredients that can be applied to stiff ground. The way this is obtained requires some little care and time; but the process is simple. A situation having been selected for the fire, let the bottom be made smooth, and let two small ditches, about four inches wide and as many deep, be cut intersecting each other in the manner of a cross, and let these be covered over with bricks or flat stones, but not tight-jointed, and at the center, where they cross each other, raise a heap of stones or brickbats, say a couple of barrow loads, and on this pile some rough, dry wood, &c., which, being lighted, coarser pieces may be added, and amongst these some rough pieces of clay or loam may be placed, observing to apply it at first by hand, so that none of the finer particles be likely to choke the fire; rough, woody roots, or other combustible materials, may be added alternately with the clay, taking care that at the first start the proportion of clay be not too large; by-and-by, however, it may increase, for the process may be carried on for weeks, taking care to supply it occasionally with loose wood and clay, but on no account to disturb any part of the burning mass until you be satisfied with the quantity that is done. This process is called clay-burning, and is successfully practiced in some places; the merits of the article for heavy land are, doubtless, of the first order.

It is necessary, now, to look to the other portion of the heap, which, in addition to the roots and stalks consumed as above, contains, doubtless, the decayed weeds and flowering-stems of the flower-garden, with a tolerable proportion of stones, as the case may be. This is likewise a useful adjunct to stiff, clayey lands, and can not, therefore, be better employed than by being well mixed up until all parts of it be decomposed, and then be carried out on the tillage lands. And as there are few things, stone excepted, but which will either burn or decay, the waste substances of the rubbish-heap may again be appropriated to replace the loss the ground underwent by its removal. Cultivation is also much benefited by an interchange of ingredients. Witness the advantage of trenching; the subsoil brought to the top, mixing with what was there, a compound is created better calculated to sustain vegetable life, than, to all appearance, a richer soil is capable of doing alone. But there are some things to which a sort of use is put during their preparatory time; of this class, tree-leaves are, doubtless, the most pre-eminent; but as these are so well known, it is needless to say more. Grass from the lawn, is, however, less usefully employed, but it may be made to work the frame, and, doubtless, is an excellent adjunct to the hot dung sent there, but being more violent and less lasting in its heating powers, some care must be taken in using it. But it may be rendered very useful if there be any old, dry leaves at hand to mix it with; these, by absorbing part of its fermenting juices, modify and mitigate its obnoxious qualities, and a little time taken in preparing it, by repeated turnings, &c., is well rewarded by the mild, regular heat it gives afterwards. Short grass, however, to become useful, ought not to lie and heat, and cake into lumps first, for by so doing its best and most active juices are thrown off. Short grass may also be usefully employed in shading or protecting the ground from the effects of a too hot sun; strawberries, newly planted trees or shrubs, and many other things, will be all benefited by a slight covering of short grass, which, preventing evaporation, is of great service to the crops to which it is applied.

In the class of "waste materials," many things may also, doubtless, be added, which have only a local position; in other words, certain places or districts afford useful substances for improving the quality of the ground or crop, which are not to be found

every where. And it often happens that nature has been so kind as to furnish each district with what is best suited to its particular wants; some of our lightest lands containing the richest marls beneath their surface. What useful refuse a brick-yard contains, and how often it is allowed to lie and waste. A peep into the court-yard of premises undergoing repair will also often show quantities of mortar, rubbish, and other substances thrown into some hole to fill up a space which a less valuable material would have done as well. Stones themselves are not without their use on land; and I have seen a piece of stiff, retentive clay land much improved by a good dressing of the waste from a sand-stone quarry. Road dirt is also useful; for, apart from the value which the dung from animals gives it, the grindings of the stone is also of great service. Many other things might also be adduced, but the above is sufficient to call the attention of gardeners to the "small matters" connected with the "compost heap." Manures of the more prominent kinds it is needless here to mention, because it is expected that they are duly cared for in the proper way.

I might also add, that liquids ought also to be properly attended to, for it not unfrequently happens that some of them are allowed to waste. Perhaps, as useful a way to dispose of small quantities, is to pour them over the compost mixture, which may consist of a variety of materials all blended together, and which may be all used to advantage when the proper season comes round for digging the various plots; always taking care to preserve some of the richest and best manure for certain crops, as celery, where the space only allows a small quantity of it at a time. J. Robson.

Life.—The process of human life consists in there meeting together in the lungs, every twenty-four hours, two thousand gallons of blood and three thousand gallons of air. Good health requires this absolutely, and can not be long maintained with less than the full amount of each; for such are the proportions that nature has ordained and called for. It is easy, then, to perceive, that in proportion as a person is consuming daily less air than is natural, in such proportion is a decline of health rapid and inevitable. To know, then, how much air a man does habitually consume, is second in importance, in determining his true condition, to no other fact; is a symptom to be noticed and measured in every case of disease, most especially of disease of the lungs; and no man can safely say that the lungs are sound and well and working fully, until he has ascertained, by actual mathematical measurement, their capacity of action at the time of the examination. All else is indefinite, dark conjecture.—Hall.

From the California Farmer.

The Vineyards of Northern California.

The agricultural resources of this State, although little known, and comparatively undeveloped, are of the very first class. Its valleys are very extensive and fertile, possessing a capacity for production unequaled by any portion of the Union. I have lately visited portions of the northern parts of the State with reference to its capacity for fruit-growing. For the peach, pear, apple, grape, &c., I think it has no equal. There are several vineyards now in full bearing in different parts of Northern California, fully sustaining this character of its soil and climate. In the valley of Santa Rosa there is a vineyard of two thousand vines. One hundred of these are fifteen years old. These are trained to the hight of six feet, and then allowed to spread at random upon a frame-work, having a free circulation of air. They are trimmed every winter to a mere head, leaving only from three to five buds for wood and fruit. The remainder of the vines in this vineyard are two years old. They are trimmed low to a standard within six inches of the ground, and it is intended to grow the fruit thus near the earth. The theory is, that the fruit near the ground will be shaded and protected from the extreme heat of the sun. How the experiment will succeed, I am unable to determine. The soil is a clayey loam on a level surface.

Sonoma valley has the finest vineyards in Northern California. It contains about five thousand vines, planted six feet apart. The soil is a grayish loam, breaking into lumps the size of a large potato, in working, and easy of cultivation. The vineyard is situated on a gentle declivity of the foot hills of the Contra Costa range of mountains. There are several unfailing springs running from the hill-sides above, which furnish an abundance of water for irrigation. These springs are highly impregnated. A portion of this vineyard is fifteen years old, and is bearing abundantly. The vines are trimmed to a standard of about two feet, and every winter all the wood of the previous year is trimmed off, and only from three to five buds are left for wood and fruit the ensuing year. This trimming is done from November till March. The older vines are supported by braces where necessary. The growing wood of the old vines is interwoven in the form of a large hoop, and the vine is then made to sustain the whole weight of the branches and fruit of the year. The grapes hang in large beautiful clusters near the head of the standard of the vine, and are mostly protected from the rays of the sun in this manner. The whole vineyard is occasionally irrigated. The income of this

vineyard is estimated at $20,000. The climate of this valley is dry and of a moderate temperature.

There are also two vineyards at the old Mission of San Jose. One of these contains about four thousand vines, in a tolerable condition. They are trimmed to a standard about two feet high, and from three to five buds are saved for wood and fruit. The vines are allowed to spread at random over the ground during the summer. This vineyard is irrigated. The other vineyard is small, and some of the vines are said to be sixty years old, and planted about six feet apart. A portion of the ground is in grass, and only a small space around each vine is cultivated. This vineyard is not irrigated. The soil is a dark loam, breaking into small lumps, and easy of cultivation, with a dry limestone subsoil. This soil is well adapted to the vine.

There are two vineyards in Napa valley—one of them, belonging to a Mr. Yount, I have not seen. [The editor announces that this gentleman manufactures about one thousand gallons of a very good wine, of fine body, and resembling Bordeaux claret.] A part of it has been planted fifteen years, and produces abundantly. The other is owned by Mr. Kellogg, formerly of Illinois. It was planted in 1849. It is situated on a level piece of ground, under the brow of a high hill, with an eastern exposure. The surface is level, and the soil a gravel full of large and small stones, and very different from any other I have examined. There are about fifteen hundred vines, and each one is trained to a standard of two feet. They are trained after the manner of the other vineyards I have described. In the spring, before the vines commence growing, this vineyard presents the appearance of so many small stumps of trees. This vineyard is irrigated three times every season—once when the fruit is setting, again when it is half-grown, and lastly when the fruit is ripening. The vines spread at random over the ground. This vineyard is productive, and pays well. There is also a small vineyard at Livermore's Ranch, on the Contra Costa range, about twenty miles east of the Mission of San Jose. It has been planted about fifteen years, and is trimmed to a standard of about six feet, and allowed to spread at random upon framework. It is trimmed after the manner of the other vineyards I have mentioned. This vineyard is an alluvial soil, on the banks of a mountain stream. The soil is a black clay, mixed with very rich black vegetable mold, very soft and adhesive, and even miry in the winter. In summer, it becomes very dry and hard, and cracks to the depth of several inches, and is full of large crevices. The fruit is said to be very sweet.

The climate of all the valleys of Northern California is dry in summer, and well adapted to the culture of the grape. There is no such thing as the rot, to my knowledge. A large portion of the country is underlaid with limestone rock, and has a subsoil well adapted to the vine.

There are a number of old vineyards in Lower California, which are very productive. The grapes are shipped to San Francisco, and sold at high prices. Of these vineyards, however, I know nothing personally. Only one kind of grape has been cultivated on this coast. It is believed to be the Malaga grape of old Spain, introduced here about one hundred and fifty years since by the Roman Catholic missionaries who visited this country. It is a grape of a fine quality, and well acclimated. [Adapted to the climate.] E. TOWNSEND.

Is Lime a Manure.

[A writer in the *Practical Farmer*, a Boston periodical of great merit, which has recently made its appearance, gives a sensible rebuff to the editor of the "*Plowman,*" of the same city, who has joined the unnatural hue and cry, that certain portions of the agricultural press have been induced to set up against the advances of chemico-agricultural science, and the applications of manures, which have naturally ensued. It has been my intention to prepare some articles upon the subject of manures, for the guidance of gardeners especially; for they are willing to admit that even our fertile western plains may be benefited by additional fertilizers, even though their brother farmers still insist upon the absurd idea that the soil is inexhaustible, and that it will not pay to expend money and labor in enriching the land—they have demonstrated that it will pay in the garden, at least. The following remarks upon lime may be valuable to gardeners as well as to farmers.]

Is lime not a manure in any sense of the term? Let us consider what manure is. Manure is the food of a plant. It bears the same relation to the plant, that food does to an animal. It furnishes the elements which make up the several parts of which plants consist. Thus, ammonia and its salts are manures, because they furnish nitrogen to a plant. Farm-yard dung is a manure, because it furnishes to plants a portion of all their constituents. Potash and soda, and their salts, are manures, because, in addition to their chemical effects on the other substances present in the soil, they are themselves constant constituents of vegetables;

and, in a similar manner, lime is a manure, because, in addition to its mechanical and chemical effects, in ameliorating the physical constitution of the soil, and correcting the injurious substances present in it, it is itself a constant constituent of most vegetables, and especially of those most cultivated by the farmer. Chemical analysis has demonstrated that it exists largely in the ash of the cereal grains, and of their straw. It is still more abundant in the straw of leguminous plants, and in the root crops; while in the tops of the root crops, it is by far the most abundant inorganic ingredient.

More than a third of the ash of clover consists of lime; and experience has proved, that lime will enable clover to grow on soils, upon which, before the application of lime, it would not grow; and it could not grow, because lime was not present in that soil.

If lime is not a manure, then no one of the mineral ingredients of plants is a manure. But this would be a sweeping conclusion, and in order to test its accuracy, it would be advisable for the objector to make a "trial," if not with lime, without it. Let him take a quantity of soil, entirely free from lime, and attempt to grow upon it a crop of wheat, or of clover, or any other crop usually cultivated; and if he succeeds in bringing it to perfection on that soil, however well supplied with the other substances necessary to the growth of plants, his position will be made good; he will have achieved a brilliant discovery; and overthrow the false positions hitherto occupied by agricultural writers. He may then be proud, and exult in the title of anti-lime man. But until by a "trial" he does so, it would be advisable for him to desist from circulating opinions, unfounded by trial, and at variance with the experience and science of the world.

Gelatine.—Isinglass represents the chemical body termed gelatine, which consists of carbon, hydrogen, nitrogen, oxygen, and sulphur. To speak strictly, it does not exist in the animal tissues, but is formed out of certain of these by the action of boiling water. Gelatine is soluble in hot water, and by cooling forms a jelly. It is precipitated by tannic acid, and upon this property depends the formation of leather. The gelatinous tissues, as they are termed, are the bones, the tendons, and ligaments, the cellular tissue, or filamentous tissue, and the membranes in general. Gelatine is found to be more closely allied to albumen, fibrine, and caseine, than was at first supposed. It is believed, however, that it can not be transformed within the animal body into albumen, fibrine, or caseine; and that is the reason why animals fed exclusively on gelatine die with symptoms of starvation.

Grape Culture in Tennessee.

We copy the subjoined article from the Knoxville *Register*, of recent date:

To the Editors—Last September, in company with Messrs. Chas. H. Coffin and James M. Welker, Esq., I visited Capt. Campbell's vineyard, about ten miles above this place, on the French Broad river. Mr. Campbell's vines had produced an abundant crop of grapes, of most excellent flavor. Mr. Coffin had visited Cincinnati the spring previous, and both of us, but particularly Mr. Coffin, had collected what information we could on the subject of the vine. We were both satisfied, from the success of Mr. Campbell's experiment, that the grape can be cultivated to better advantage in East Tennessee than in the vicinity of Cincinnati, where it is cultivated largely, and many of those engaged in the business are accumulating large fortunes. Why can not our people here, with superior advantages in soil and climate, for the culture of the vine, achieve the same or even greater results?

In hopes that others might be induced to follow Capt. Campbell's example, I addressed him a letter on the subject, to elicit from him his mode of cultivating the vine. Enclosed I send you his reply, which, if you think of sufficient interest to your readers, I would be glad to see in the columns of your paper.

Most respectfully, your ob't serv't,

John H. Crozier.

Knoxville, Feb. 20, 1854.

Col. J. H. Crozier—*Dear Sir:*—I received your communication, with regard to my mode of cultivating the vine, in good time. I found the vine, the one I am now cultivating, in the neighborhood. All others, with me, have entirely failed. I procured four cuttings from the vine, and planted them; they bore grapes at three years old, and have borne abundantly ever since. I was encouraged to persevere, and as soon as I could obtain cuttings, I commenced a vineyard on the following plan: The southern exposure, hill side, clay soil. I then cut trenches eighty-five yards long, two feet wide, and two feet deep. I then packed rock in the bottom of the trenches, and then filled up with manure from the stable and chip-yard, or any vegetable manure. In these trenches I placed cedar posts ten feet apart, well crammed with rock, planted two slips with four eyes each at opposite sides of the post, ranging about forty-five degrees, with their top ends close to the post. My object in planting the two was in order to insure a stand of vines. If they both grew, I took one up the spring following.

The arbor is made of chestnut rails about six feet from the ground, but this plan I will

stop, as it is very expensive, and requires a great deal of labor.

Last spring I planted about one fourth of an acre on the stake plan, (the modern plan in Europe, Ohio, &c.) In this way it is trenched in the same way that the other is, only the trenches are about five feet apart, and the vines allowed to grow upon stakes six feet long. In the spring I will cut down the vines to a single eye. This plan I think will succeed better than the other. This vine does not require the heavy pruning that other varieties usually do. February is the time for pruning this vine. In this process cut off all surplus wood, train so as not to grow too close, and tie them to the arbor with willow switches, so that wind will not misplace them, and by this means the clusters will hang regularly over the entire space. If the vine appears weakly, and not likely to grow rapidly, I mulch them with straw, &c. I have also made other experiments, by burying dead animals, such as dogs, cats, hogs, sheep, &c., &c. This animal matter proves very good manure for grapes.

From my vineyard this season, I have made two barrels of wine, which is now done fermenting and is very good. Besides the quantity of wine, we sent four hundred barrels [? pounds] of grapes to the market.

Yours, &c.,

James Campbell.

Feb. 13, 1854.

[From the Sumter (S. C.) Banner.]

Renovation of Southern Soil.

To the President and Members of the Sumter Agricultural Association:

Gentlemen — As improvement in every branch of Agriculture is the object which our Association has in view, I deem it proper to address this and other communications, relating to agricultural art or science, to you, trusting the views set forth may lead to the communication of important facts by others.

The improvidence of the Southern planter has become almost proverbial. He begins by preparing the woodland for the culture of corn, cotton, &c., and at the end of a few years the fertility of a large part of his cultivated land has become exhausted, by neglecting to restore to it what has annually been abstracted by the growing crop. The remedy for this has been to lay it aside, and prepare a fresh piece of woodland for culture, until, as it often turns out in the course of his planting operations, he has cleared three or four times as much land as he annually cultivates. Now, though it would be better economy to renew regularly in the soil what it loses from year to year in the bringing to maturity the cultivated crop, than to defer this labor till it has become utterly impoverished, and then resort to some means of renovation; yet, as such economy is so little practiced, we propose the question to any planter who designs clearing and substituting new land in place of what he has exhausted—Would not the labor and expense of renovating your exhausted land be less than that of clearing and preparing for cultivation, the same extent of woodland?

We feel assured (though all planters have not equally at command the materials for cheap renovation) that such would be the result of actual experiment in nine cases out of ten, in which the simple means of renovation, hereafter pointed out, are employed. Both observation and experiment furnish us with a reason for the faith that is in us, viz.: that, whenever there is a sufficient body of woodland adjoining, or near by the cultivated field, and rotted vegetable matter may therefrom be provided in sufficient quantity, and at a convenient distance, the renovation of the soil in such a field is not only practicable, but attended with less labor and expense than the preparation of the woodland for cultivation. In seeking to effect this end, (renovation,) the planter can not err in adopting the simple means which nature employs, with the same end in view. In the leaves, straw, bark, &c., with which she annually covers the face of the earth, is provided an ample store of the food requisite to sustain the plants and trees which grow upon it. They contain the very ingredients of the natural soil; and in their decay and decomposition, evolve whatever elements it may be necessary to return to it, in order to restore its fertility. Chemical analysis of the seeds and roots of cultivated plants, and of the leaves, straw, and bark of a great variety of trees, abundantly proves this; and shows us, farther, that in the beautiful economy of nature, the elements of nutrition for plants exist in these products which she annually returns to the soil, in far greater proportion than they do in the bodies and branches of trees. What, then, has the planter to do, in order, either to restore to the soil before it becomes exhausted, whatever is needed to secure its fertility, or to renew the fertility of one which he has exhausted? but to draw from the woodland, adjoining his field, a sufficient quantity of the very material which originally fertilized it. It is sometimes important to ascertain by an analysis of the soil, what elements may be needed to restore its fertility, but we believe it rarely happens that they can be provided as cheaply in their separate form, as that in which they may thus be provided by a greater majority of planters. While, therefore, we rejoice that science begins to shed its light as a guide to the planter in his operations, let us not overlook or undervalue the plain teaching of nature, because the truths she discloses are

not brought to view by the light of science. By the decomposition of the leaves, straw, &c., which fall from the trees, other purposes in the economy of nature are answered, besides preserving or renewing the soil, but the planter having this end solely in view, may accomplish it in a comparatively short time—and apply the same materials in a form better adapted to other objects he has immediately in view.

Four great advantages, for example, are gained by applying the straw, &c., for the purpose of renovation, in a rotted, instead of a fresh state. As far as our observation extends, these substances have been used in the few experiments made to test their effects as a renovator, either in a fresh or very partially rotted state. Various disadvantages attend the use of them in this form, which do not attend their use when thoroughly decayed. The labor of carting fresh litter is comparatively much greater; which is owing to the difficulty of compressing it to a convenient bulk for loading and hauling. No more than a comparatively small quantity can be plowed in the land. The soil is choked, and the roots of young plants very much obstructed by it. To this add, that in consequence of its slow decomposition, and the small quantity plowed in, the increased fertility is not always perceptible. We are satisfied, however, from a full experiment with it, that a highly profitable use may be made of vegetable matter obtained from the woodland as a renovator, by collecting it in large piles, and suffering it to lie for a twelvemonth or more, before being plowed into the land. By this means the bulk of vegetable matter is reduced to about one fourth, and this lessens, in a considerable degree, the labor of carting: in its then partially decomposed state, it immediately provides nutriment for the growing plants, without obstructing its roots as fresh litter does; while no quantity that can be plowed into the land will prove too much. We need scarce remark that the addition of even a small quantity increases its efficacy as a manure. We invite your attention, however, to a fact stated by Mr. Pell, an agriculturist of high reputation, in a communication on the subject of vegetable matter as a manure. He informs us, that when collected in a heap, with a certain quantity of powdered charcoal strewn over it, (which answers the purpose of absorbing and retaining the ammonia which would otherwise escape,) it becomes, when rotted, a manure superior even to stable manure. As charcoal is the very best known absorbent of ammonia, (a principal food of plants,) we question not that great advantage is derived from the use he makes of it.

As an experiment by which to compare the labor of renovating the soil by the means we have adverted to, with that of clearing and preparing new land for cultivation, we have, as we believe, by such means perfectly renewed the soil on six or seven acres of old, exhausted land, and are satisfied that the expenses of a perfect renovation need not be above one half of the latter operation. We have, also, as a means of providing a larger quantity of manure for our fields, resorted latterly to the plan of providing rotted litter from the stable and cow-pen, by suffering it to lie in piles a sufficient length of time before making use of it; and in consequence of the ease with which it is reduced to a proper consistency, the same quantity of good manure is made in a comparatively short time, and our manure heap is more than twice as large as it formerly was. The proportion of animal excrements to the whole bulk of manure is necessarily smaller, but our observation thus far satisfies us that it nevertheless possesses equal efficacy with that made with fresh litter. We repeat the hope, gentlemen, that what we have written may lead to other communications from those among you possessing greater experience in agricultural affairs than yours, &c.

GREEN SWAMP PLANTER.

Apples from Seed.

Here is something, again, for thought and experiment. We cut it from an exchange paper. The thing stated may be a fact. If so, who will estimate the value of the discovery? The suggestion is at least worthy of attention, and it remains for observers and experimenters to prove how much of reality lies at its foundation. To try suggestions of this kind, to prove all things, holding fast only to those which are good and true, is the sure way of improvement and success. We shall hope to hear more of this from American experimenters. The statement appeared many years ago, but we are not aware that it has ever either been confirmed or disproved by competent authority. Whatever the fact may be, the statement is again making its appearance in respectable journals; and if no one is yet prepared to come forward with the proof, either that it is true, or that it is not, it is quite time some one set about its investigation.

GOOD FRUIT WITHOUT GRAFTING.—In every perfectly ripe apple, it is observed in an English publication, "there will be found one or two perfectly *round* seeds, the others having one or more flatted sides. The round ones will produce the improved fruit, and the flat ones will produce the *crab.*"

The Seventeen-Year Locusts.

These singular insects have made their appearance in this section of the State in great abundance. The timber around this city is perfectly swarmed with them, and the air is filled with their doleful music.

The habits of this locust are quite singular. They make their appearance in certain districts every seventeen years. But they do not appear in all these districts the same year. They are frequently found in some part or other of this country every few years, but they never appear in the same district oftener than once in seventeen years, except where two districts lap or join. Through the central part of Pennsylvania, there is a strip of country where they appear every seventh and tenth year alternately. And in Virginia there is a valley where they appear every fourth and thirteenth year alternately, and according to an article we saw several years since, there is a district in Texas where they appear three times in seventeen years. Entomologists account for this by showing that there are three distinct races that inhabit this district, each maturing at different periods.

This insect is not the locust which is spoken of by Moses, as having destroyed all kinds of vegetation in Egypt, as it is found only in the United States. In fact, it is not strictly one of the *locusta* family, but belongs to the *cicadæ* family, of which the large black horse-fly is a species. The scientific name of this insect is the *Cicadæ septem-decem*, from the fact that they make their appearance every seventeen years. They emerge from the ground, generally about the first of June, or if the spring is early, through the month of May, and always during the night. On their first coming out, they are in the form of a grub, or *pupa*, with two stout diggers or front legs. They generally crawl up a twig of grass, or on the side of a tree or shrub, where they can enjoy the heat of the sun. After a short warming, the pupa contracts so as to cause it to burst open on the back, through which the perfect insect escapes from its long confinement, to bask in the warm sunshine, instead of groping its way in the dark through the cold earth.

They begin to lay their eggs about the middle of June. These are deposited in close lines of several inches long, in tender twigs of trees. The eggs remain in these twigs until they are hatched out by the sun. The young are in the shape of a maggot, or small grub; as soon as they escape from the eggs, they drop to the ground, into which they descend from three to six feet, and remain there the long period of seventeen years, by which time they are again prepared to emerge from their gloomy caverns. Notwithstanding the usual idea that they are destructive to vegetation, they are in no way injurious; they live by suction, having a bill similar to the horse-fly, and feed on the moisture of the leaves of trees and grass, never attacking the leaves themselves. The only damage they do, is done by the female in depositing her eggs; the branchlets generally wilt and die from the wound made by her.

These insects are the favorite food for various animals. Immense numbers are destroyed by hogs before they emerge from the ground; they are, also, when in their perfect state, eagerly devoured by squirrels. Some of the large birds are also fond of them. The Indians, likewise, consider them as delicate food when fried, and, consequently, feast upon them while they last. In New Jersey they have been used in making soup. They remain until the middle of August or the first of September, and then die.—*Ottawa Free Trader.*

The Insects that Injure Plants.

There is not an orchardist, gardener, or florist, but is more or less annoyed by insects. Hundreds of remedies have been suggested, and but few answer any good purpose. We were recently passing through the grounds of an old cultivator, and saw great numbers of small bottles hung in the trees. We inquired the object. To catch the curculio, was the reply. The bottles were partly filled with sweetened water, and had caught any quantity of flies and millers. But the curculio had never ventured in. The curculio does not eat the fruit, he only deposits an egg in it, while the fruit is young; the egg hatches out a maggot. This maggot preys upon the fruit. The bottles may do to catch wasps, which injure vast quantities of ripe peaches, figs, grapes, &c. There are many destructive insects which are kept off by offensive smell. Whale oil and tobacco-water are sometimes used with great success. We have seen fish placed on the melon and cucumber hills, which, as they decomposed, effectually kept away the striped bugs, and afterward fed the plants. Tobacco-water may be good to kill the insects, but it can do the plant no good. A strong solution of guano, or hen manure, is the best thing we ever tried for bugs, worms, and lice that infest plants. The water should stand until it becomes offensive, before it is used.

The apple and peach borer may be checked by this application, and the tree improved. Dry guano, mixed with plaster, may be dusted over limbs that are infested with the aphis, or over vines that are troubled with lice. We think this application would prevent the blight in the pear-tree, as the blight is caused by an insect.—*Soil of the South.*

How to Describe a Plant.

There are few who know how to do this well; many who can not do it at all. Many persons, and observers and lovers of flowers, too, in the course of casual trips about the country, come across plants that attract their attention, from their novelty and beauty, the pleasurable recollection of which, so far as regards general impressions, they take home with them; but they are unable to answer inquiries as to the external characters of the plants they have admired, or to give anything like a description by which they may be recognized. This is often a source of great regret: and the knowledge of many a plant of real interest and value has thus entirely passed away. The deficiency is particularly to be lamented on the part of travelers in new and distant countries. How often have we been annoyed by the careless manner in which tourists have dismissed their observations of striking novelties in vegetation, by the simple statement, that they saw "singular looking," or "shrub-like," or "weedy" plants, with "queer-shaped," or "odd-looking," or "peculiar" blossoms; excusing the meagreness of their accounts by the acknowledgment of a regret that they were not botanists, and could not represent the things more satisfactorily.

Now, to have done so intelligently and satisfactorily, it needed not that they should have been botanists. A brief and simple knowledge of a few important points of description, is all that is needed to enable any one of ordinary discrimination to describe a plant with clearness and accuracy, and this, when he knows nothing of its name or botanical position. Some of these points and characters I propose briefly to enumerate, for the guidance of those who have not made technical botany a study.

A plant then, is, first, either woody or herbaceous; the last are usually of low growth, though some, like the mulgedium and sun-flower, attain a large size; the former may be shrubs or trees: and the magnitude should be noted, together with the general shape, as tall, low, slender, bushy, tapering, spreading, etc.

Its leaves may be simple or compound; the latter are pinnate, and the secondary leaves are called leaflets; these may be few, as in the bean, or numerous, as in the locust and ailanthus. Leaves (and leaflets) may be entire, that is, uncut around the margin, or coarsely or finely toothed; varying to deeply or slightly lobed. They may be broad, short, and of various sizes; smooth, (without hairiness,) rough, (hairy,) dark, light, (in color,) thick, shining, etc. The shape of leaves is also of value. They may be round, oval, angular, lance-shaped, linear, (long and narrow,) pointed, obtuse, heart-shaped, deltoid, etc. They may be petiolate, (with long or short foot-stalks,) or sessile, (without foot-stalks, attached directly to the stem.) Two large divisions of the vegetable kingdom are formed upon the character of the venation, or arrangement of the veins of leaves; and it should be observed, whether the veins are parallel, running from the base toward the point in more or less straight lines, in the direction of the mid-rib, or whether they ramify more or less irregularly, forming a sort of net-work, branching from the mid-rib.

Of flowers, omitting the many minor details and shades of difference, I shall indicate only such points as are easily observed, and are most important. They may be sessile, (seated immediately upon the stem) or attached to the plant by means of a peduncle or stalk, which may be terminal, (at the end of the branch or plant,) or axillary, springing from the axils, or place of junction of the leaves; or radical, springing directly, without leaves, from the root. The flowers may be solitary, only one blossom to a stalk or peduncle, or the peduncles may produce many blossoms, variously disposed in heads, bunches, clusters, etc., either simple or compound. The peduncle, or flower-bearing pedicils, where the former is divided, is terminated by a receptacle upon which the various parts of the flower are seated. This is usually surmounted by the calyx, or outer green leaf-like envelope, encircling the petals. The calyx may be wanting, as in

the tulip. When it is present, the petals, or colored expansions of the flower, are within it, and may be either attached to it, or seated directly upon the terminal disk, or apex of the receptacle.

Flowers are simple or compound; simple, when each receptacle bears but one blossom, easily distinguishable, however densely crowded, as in the alder; compound, when the receptacle sustains several associated flowers, forming a head, as in the aster and chrysanthemum. Simple flowers are either monopetalous, or polypetalous. The first, in which the petals are formed of only one piece, entire, or more or less deeply notched and divided, are distinguished by their position and shape; they are erect or pendulous; cup-shaped, funnel-shaped, bell-shaped, tubular, globular, wheel-shaped, (the limb or outer edge extending over and beyond the tubular part), or labiate, (divided into two lip-like processes); ringent, (when the lips are open and gaping); personate, (when the throat is closed by an extension of one of the lips). These are further distinguished by the regularity or irregularity exhibited in the general arrangement of the different parts of the flower. Polypetalous flowers, composed of two or more petals, any one of which can be removed without tearing the adjoining ones, are also either regular or irregular. Regular, when their arrangement in relation to one another is equal and symmetrical; irregular, when such symmetry of disposition is not observed.

A large portion of polypetalous flowers will be found distributed among five well characterized forms: the *cruciferous*—(cross-like), having four petals arranged around four stamens in the form of a cross: the *rosaceous*—(rose-like), having five or more spreading petals surrounding numerous diverging stamens: the *caryophilous*—(clove-like), whose petals have long claws inserted into a close clove-like toothed tube or calyx: the *papilionaceous*—(butterfly-like), having irregularly arranged petals, resembling the flower of the bean and pea; and the *liliaceous*—(lily-like), having three or six usually long petals, tapering from their base, which is their broadest part. There are still a large number left which can not be included in any of these divisions, whose peculiarities are susceptible of simple special description, their characteristics being very well marked. In some flowers, the petals are colorless and inconspicuous, and they are frequently entirely wanting. Of these last the calyx is in some finely colored, while in others it remains green.

The number, position, and comparative length of the pistils and stamens should also be noted. These are points of easy observation. It is important to regard the place of insertion of the stamens; that is, the parts to which they are attached; as whether to the inside of the calyx, to the petals, to the disk or top surface of the receptacle, or to the pistil. The points of attachment may be readily seen by pulling down the segments of the calyx and the petals. If the stamens move with these, they are attached to one or the other; if they do not move, observe whether they stand upon the disk surrounding the pistil, or whether they are really attached to it. The thread-like filaments of the stamens are sometimes separate and distinct, as in the rose; and sometimes they are united, either at their base only, or occasionally along their entire length; forming sometimes but one bundle, and sometimes two, three, or more. The pistil occupies the center of the flower and terminates the vegetating process. It is generally a simple entire piece, but is frequently variously divided; sometimes from the base up, when the parts are considered as so many separate pistils, and sometimes only at the apex, when the divisions are counted as so many stigmas, which are the cellular expansions that receive the fertilizing pollen dust from the anthers of the stamens. These stigmas are of various forms; they may be globose, lobed, forked, filamentous, plumose, (feathery), fringed, etc.

Reserving a more extended account of the *fruit* of plants than I have room for now, for another paper, I shall close this sketch by a reference to the general forms of inflorescence, presented by different groups of plants. By this is meant the natural disposition of the blossoms with regard to the plant and one another. Inflorescence may be simple when each flower is supported upon its own flower-stalk or peduncle; or the stalk may produce other secondary flower-stalks, called pedicils—the whole constituting a bundle or bunch—of which there are various forms, taking different names. Sometimes the flowers are loose and scat-

tered, (panicled), as in the columbine and multiflora roses; sometimes close and dense, (corymbose), as in the spiræa and eupatorium; sometimes the bunches are elongated and cone-shaped, (thyrsoid), as in the lilac; sometimes flat and spreading, (umbelliferous), as in the coriander and elder; sometimes they are in dense heads, as in the scabious and aster; and sometimes in elongated spikes, as in the wheat and veronica. The peculiar drooping, scaly spikes of the willow, poplar, birch, etc., are called catkins. The cones of the pine family are familiar to all.

Now, whoever imagines I have here given a summary of so much of botanical technology as relates to the parts of vegetation I have enumerated, will make a great mistake. I have designed only the presentation of a few easily observed points, or characters, by attention to which, any one, however slight his knowledge of botany, may be enabled to give an intelligible account of any plant to which he may have occasion to allude. By a judicious application of these hints, a traveler will be better able to record any thing he has seen of interest in the vegetable world; and to convey to others an appreciable notion of its form and appearance. Of the fruit hereafter. J. W. W.

CARBON.—At ordinary temperatures, carbon is a solid body; and its most familiar form is the charcoal of wood. Uncombined, it exists very sparingly in the mineral kingdom; but combined with oxygen, in the form of carbonic acid gas, it exists abundantly, as in combination with earthy and metallic bases. The carbonate of lime, as chalk, marble, limestone, marl, is one of the most abundant substances in mineral nature; and of this substance carbon forms one seventh part by weight. In the atmosphere carbonic acid is uniformly present, but in variable proportion. It exists also in waters. The respiration of animals and the combustion by common fires are continually adding to the carbonic acid of the atmosphere; while the process of vegetation is as constantly decomposing it, appropriating to itself the carbon, and setting free the oxygen. In dried muscular flesh the proportion of carbon by weight is not far from one half; and in the tissue of wood the weight of carbon is nearly three sevenths.

Town Roses.

The Roses named in the following list are all adapted to town gardens, having been subjected to the smoke and atmosphere so peculiar to large cities, and found to do well. Roses, of course, love best the pure uncontaminated air of the country; and some will thrive in no other. It will be well, therefore, to know what kinds may be safely introduced into our town gardens. It should be stated that the nature of the soil will have a marked influence on the health and vigor of all roses: and too much must not be charged to the dry, smoky, dusty air of the town. It will be seen that some are named that require protection in winter.

PROVENCE, OR CABBAGE ROSES.

Aspasie, delicate blush.
Blanchfleur, white, blush center.
Cabbage, red.
Cristata, bright rose, globular.
Duchesse d'Angoulême, rose, cupped.
Dutch Provence, blush, scented, df.
Glory of France, fine large, red, df.
Globe, white hip, cupped.
La Volupté, vivid rose, large, cupped.
Rose de Meux, red, df.
Unique, white, df.
Sponge, pale rose, df.

Prune them to six or nine inches, taking care to thin out the old wood. Those marked df. will be found to bloom most abundantly as dwarf plants, the others will do well as standards: they are all very fragrant.

GALLICA, OR FRENCH ROSES.

Assemblage de Beauté, carmine.
Belle Auguste, or Lee, pale blush.
Boula de Nanteuil, crimson, large.
Berlize, violet crimson, spotted.
Burgundy Major, red.
Cecile Boireau, rose, marbled.
Cerise, bright cherry, cupped.
Colbert, dark crimson, shaded.
Cynthia, lilac blush, cupped.
Cambronne, crimson purple, large.
Duc d'Orleans Pontuée, spotted rose.
Fleur d'Amour, shaded crimson.
Guerin's Gift, bright rose, very perfect.
Grand Tuscany, crimson, yellow center.
Henrieuse Surprise, crimson purple.
Kean, crimson scarlet, fine, cupped.
La Moscowa, dark crimson, cupped.

Leopold I., crimson.
Madame Dubarry, crimson purple.
Nelly, blush tinged with fawn, cupped
Ohl, dark crimson, scarlet shaded.
Pharericus, rosy red, large.
Petroville, fine red.
Roi de Naples, blush, rose center.
Rouge Admirable, purplish red.
Rouge Eblouissante, crimson scarlet.
Tricolor, purple, mottled, compact.
Tricolor Superba, crimson, white stripes.
Triomphe de Flore, red, fine, compact.
Vesta, scarlet crimson, very large.
Violette Rouge, violet, marbled.
Village Maid, purple-striped.
Village Maid, (New), red striped.
William IV., bright rose, large.
William Tell, rose-edges, blush, large.

This class of Roses are very showy, and brilliant in color; they make good show Roses. Prune six to twelve inches in length, thinning the old wood out moderately. Rich and rather stiff soil will suit this class well.

HYBRID CHINA.

Aurora, crimson purple, striped.
Belle Marie, pale rose, red center.
Becquet, crimson center, edges purple.
Blairii, No. 2, blush, rose center, p.
Beauty of Billiard, bright crimson.
Camuzet Carnée, delicate pink.
Coupe d'Amour, deep rose, cupped, p.
Comtesse de Lacepede, pale blush.
Chenedole, crimson, large, cupped.
Chancellor, purplish crimson, compact.
Colonel Coombs, red, lilac, spotted.
Duke of Devonshire, lilac rose, striped.
Daphne, carmine, distinct double.
Fimbriata, bright red.
Fulgens, crimson velvet, cupped, p.
General Lamarque, violet purple.
General Christiana, cherry, distinct.
General Allard, rosy red.
General Kleber, purplish red.
Grand Mogul, dark crimson, fine form.
Hypocrate, rose, superb.
Hortensia, deep blush.
Hooker's Prince Albert, pink, cupped.
La Tourterelle, dove color.
La Grandeur, rose, compact.
Lord Nelson, velvety, black lake.
Marie de Nerræa, light pink blush.
Magna Rosea, blush, large, cupped.
Marechal Soult, vermilion, double.
Madame Plantier, white, double.
Ne-plus-ultra, carmine, globular.
Pucelta de Jaques, dark puce, compact.
Princess Augusta, purple crimson, p.
Promothée, rosy lilac.
Pierre Petite, rosy violet, compact, p.
Stadtholder, blush, large and double, p.
Smith's Seedling, carmine, large.
Volney, lilac, large and compact.
Victor Hugo, rosy lilac, large and full.

These should be pruned carefully, say the shoots to be shortened and left from twelve to eighteen inches long. Thin out the old wood. Those marked p. are best adapted for pillar Roses, and have a beautiful effect on short stems about two feet in hight. They all form fine standards.

HYBRID BOURBON.

Celine, rose.
Charles Duval, rose, large, double
Coupe d'Hebe, deep pink, large.
Dombrowskii, scarlet, distinct.
Double Margin Hip, pink margin.
Elizabeth Plantier, crimson and purple.
Great Western, crimson and purple.
Henrie Barbet, crimson, cupped.
Las Casas, rose, very large.
Lord John Russell, rose, large.
Richelieu Duval, pink, large, double.

These are all beautiful, and form fine standards or dwarfs. They are all robust in habit, and make the finest pole and climbing Roses for this locality.

MOSS ROSES.

Blush, fine, distinct and compact.
Celina, crimson, large.
Eclatante, rose, large and double.
Luxembourg, purplish crimson.
Prolific, dwarf, cupped.
Princess Royal, dark crimson, large.
Red Moss, large and double.
Scarlet Moss, large and double.
Unique de Provence, white.
White Bath, often striped, mossy.

The above will be found best as dwarf or half standards; they require to be pruned closely: all very fragrant.

HYBRID PERPETUAL ROSES.

Augustine Mouchelet, purplish rose.
Aubernon, crimson.
Aricia, lilac pink, globular and double.

Baron Prevost, pale rose, large.
Comte de Paris, dark crimson, large.
De Neuilly, rose, large.
Duchess of Sutherland, (Laffay's), rose.
Duchesse de Nemours, rose, large.
Doctor Marx, carmine, very large.
Earl Talbot, deep rosy pink, very large.
Edward Jesse, dark purple, shaded.
Fulgorie, deep rose.
Grand Roi, rose, very large.
Ladoiska Marin, bright rose.
Louis Bonaparte, rosy crimson, large.
La Reine, bright rose tinged with lilac.
Lady Alice Peel, rosy carmine, large.
Lady Sefton, lilac blush, large.
Madame Laffay, rose, superb.
Mrs. Elliott, rosy lilac, large.
Marechal Soult, red, purple shaded.
Marquissa Boccella, pink, large.
Melaine Cornu, reddish crimson.
Madame Dameme, rosy lilac, large.
Princesse Helene, lilac rose.
Prudence Rosser, pink, fawn center.
Rivers, (Laffay's), red tinged lilac.
Reine de la Guillotière, crimson.
Robin Hood, rosy red, large.
William Jesse, crimson, black tinged.

This class of Roses are found to grow and flower most luxuriantly as short standards and dwarfs.

NOISETTE ROSES.

Aimée Vibert, white.
Fellenberg, crimson.
Jaune Despres, reddish yellow.
Luxembourg, or Hardy, purplish rose.
La Biche, pale rose and white.
Lamarque, sulphur yellow.
Sir Walter Scott, rose.

These are good pillar or climbing Roses, and adapted for wall or trellis work: they are all perpetual bloomers.

DAMASK PERPETUAL.

Antinous, dark crimson, double.
Crimson Four Seasons.
D'Angers, delicate rose.
Four Seasons, red, semi-double.
Fabert's Grand Perpetual, rose, large.

DAMASK ROSES.

La Ville de Bruxelles, rose.
Madame Hardy, white, cupped, large.
Painted Damask, or Leda, blush.

ROSA ALBA.

Félicité Parmentier, rosy flesh.
Josephine Beauharnais, rosy flesh.
La Séduisante, white, bush center, large.
Princesse de Lamballe, white.
Pompone Blanc, delicate rose.
Queen of Denmark, blush, rosy center.
Sophie de Marcilly, pale flesh, large.

BOURBON ROSES.

Augustine, Lelleur, compact.
Armosa, or Napoleon, pink, globular.
Acidalie, white, large, globular.
A'petales creneles, rich, ribbed rose.
Bouquet de Flore, light carmine.
Celimene, clear blush, double.
Comice de Seine et Marne, variable.
Ceres, rose.
Duc de Chartres, deep rose, large, full.
Emilie Courtier, pale rose, large.
Julie Deloynes, white, double.
Latifolia, rose, double.
Lady Canning, rosy lilac, double.
La Gracieuse, red crimson, large.
Luxembourg, carmine, superb.
Le Grenadier, purplish crimson.
Madame Nerard, delicate blush, large.
Madame Lacharme, delicate flesh.
Nerine, rose, double.
Phœnix, reddish purple, double.
Pierre de St. Cyr, pale rose, robust.
Queen, fawn-colored rose.
Reine des Vierges, flesh, large.
Souchet, deep crimson, large and full.
Souvenir de la Malmaison, flesh, large.
Theresita, deep rose, cupped.

This is one of the most beautiful classes of autumnal Roses we have, the foliage being good, colors brilliant; they grow and bloom freely, and are very hardy.

TEA-SCENTED CHINA.

Adam, blush rose, large and double.
Aurora, sulphur tinged with pink, large.
Bougere, deep rosy bronze, very large.
Barbot, yellow edges tinged with rose.
Caroline, delicate pink, rosy center.
Comte de Paris, flesh-colored rose.
Duchesse de Mecklenburgh, straw.
Devoniensis, creamy white.
Goubault, rose center, buff, large.
Gloire de Hardy, pink, large.
Hymenée, blush, center sulphur.
Hardy, deep pink, large and double.

Irma, deep blush, large and double.
Macarthy, bright rose.
Niphetos, creamy white, large and full.
Safrano, bright fawn.
Taglioni, creamy white, center buff.

These grow and flower freely, requiring the same protection during winter as China Roses. This and the following class of China Roses, are well adapted for pot culture.

CHINA.

Archduke Charles, shaded rose.
Cramoisie Supérieure, velvety crimson.
Eugene Beauharnais, amaranth, large.
Fitz Eliza, blush, large and double.
Fabvier, scarlet, semi-double.
Mrs. Bosanquet, flesh, large and double.
Madame Chavent, rosy pink, large.
White.
Yellow.

BRIERS, AUSTRIAN.

Harrisonii, bright yellow, cupped.
Persian Yellow, orange yellow.
White Banksia.
Yellow Banksia.

EVERGREEN ROSES.

Adelaide d'Orleans, pinkish rose.
Félicité Perpetue, cream.
Princess Marie, bright pink.

STANDARD WEEPING ROSES

Worked on tall stems.

Ayreshire Rugo.
Boursault Amadis.
Boursault Elegans.
Multiflora Laure Davoust.
Noisette La Biche.
Noisette Jaune Desprez.
Noisette Luxembourg.
Sempervirens Félicité Perpetue.
Sempervirens Princess Maria.
Sempervirens Princesse Louise.

IRON.—Iron appears to possess important offices in organic nature. Its oxide exists, combined with phosphoric acid, in such seeds as wheat, rye, and pease; and the oxide is discoverable in the ashes of various kinds of wood,—for example, in the ashes of fir-wood the oxide has been found to the extent of 22.3 per cent. In the animal kingdom iron is a universal constituent of the blood.

The Diffusion of Seed.

The economy of Providence in distributing seeds may be remarked in those of the dandelion (*Leontodon taraxacum*), which are everywhere to be seen, during summer, floating about on the air, supported by its feathery down. It is not to be supposed that half of these seeds ever fall upon spots favorable to germination; but when so great a number of them, and of their congeners of the class *Syngenesia*, (*Compositæ*,) are scattered about by the winds, it almost raises the chance to certainty that some of them will fall on spots where before there has been none, or only a scanty vegetation; on the tops of walls, for instance, where a thin stratum of soil has been formed by the decay of the winter crop of mosses. The process of the forming of such soil is extremely interesting, and may be observed, in a small scale, even in cities on brick or stone walls. First, there is the green incrustation, called *Byssus* by Linnæus, but recently proved to be the primary germination of several mosses, such as *Polytricha* and *Tortula*. When this decays, a very thin layer of vegetable earth is formed, which affords a scanty support for the roots of the next year's crop of mosses; and in process of time soil is formed of sufficient depth for *Draba verna* and other wall plants. A singular contrivance is conspicuous in one of our wild cresses (*Cardamine impatiens*), as well as in the balsams and in Touch-me-not (*Impatiens noli-me-tangere*), a native plant of the same genus. In all of these, when the seed is ripe, the valves which inclose it are so constructed that by the influence of the sun's heat they open with a sudden jerk, and throw the seeds to a considerable distance. The effect is produced sooner and with more force when the ripe seed vessel is touched by the hand, or by any accidental waving of the leaf against it. Were we disposed to refine upon the final cause of this, (a subject very ready to mislead,) we might say that this jerking of the seeds was contrived not only for their diffusion, but for their preservation from birds and insects; since the instant that these should begin to devour them, the springs of the valves would be thrown into action, and the seeds scattered about before a single one could be secured for a meal. In the wood sorrel (*Oxalis acetosella*), as well as the

horned sorrel (*O. corniculata*), the structure of these valves is very beautiful, but no description could do justice to it, not even with the aid of figures. The first, however, abounds in most woods; and the latter, where it has been introduced as a flower, soon becomes, from the circumstance under consideration, a very troublesome weed.

One of the most beautiful contrivances for the diffusion of seeds occurs in various species of violets. The seeds of this order of plants are contained in a capsule of a single loculament, consisting, however, of three valves. To the inner part of each of these valves the seeds are attached, and remain so for some time after the valves, in the process of ripening, have separated and stood open. The influence of the sun's heat, however, causes the sides of each valve to shrink and collapse, and in this state the edges press firmly upon the seed, which from being before apparently irregular in its arrangement, comes into a straight line. The seeds, it may be said, are not only extremely smooth, polished, and shining, but regularly egg-shaped; so that when pressed upon the collapsing edge of the valve, it slides gradually down the sloping parts of the seeds, and throws it with a jerk to a considerable distance. There is another part in the contrivance of Providence for the same purpose, in the Violaceæ, worthy of remark. Before the seed is ripe, the capsule hangs in a drooping position, with the persisting calyx spread over it like an umbrella, to guard it from the rain and dews, which would retard the process of ripening; but no sooner is the ripening completed, than the capsule becomes upright, with the calyx for a support. This upright position appears to have been intended by nature to give more effect to the valvular mechanism for scattering the seeds, as it thus gains a higher elevation (in some cases more than an inch) from which to project them; and this will give it, according to the laws of projectiles, a very considerable increase of horizontal extent. Some ripe capsules of *Viola tri-color*, which I placed in a shallow paste-board box in a drawer, were found to have projected their seeds to the distance of nearly two feet. From the elevation of a capsule, therefore, at the top of a tall plant, I should think these seeds might be projected twice or thrice that distance.—*Mag. Gard. and Bot.*

Indigenous and Acclimated Products of Cuba.

To the Editors of the Alabama Planter:

Gentlemen—Believing that every thing pertaining to the soil and products of the Island of Cuba are matters of more than ordinary interest to the South, on account of its close proximity to us; our daily importations of its indigenous and acclimated products, fruits, plants, trees, and shrubs, and their almost acclimated home in the South, and particularly so in "Tropical Florida," induces me to give you some extracts from a beautiful and poetical account of the fruits and products of Cuba, by the Rev. F. W. P. Greenwood. I give extracts with occasional comments, under the impression that they will be read with a great deal of pleasure. Very little is known beyond the mere botanical description of the many tropical products with which that magnificent island abounds; therefore, an article at once so extended and so beautifully written, giving, indeed, the only true and correct account of their fruits, &c., that I have ever seen, will no doubt be read with more than ordinary interest.

Of A'chras Sapota, the Sapotilla or Sapodilla, called by the Spaniards Nispero, he says: "The tree is quite handsome. Its leaves are leathery, glossy, lanceolate, growing in thick tufts. The flowers are white, bell-shaped, with an agreeable perfume like that of fresh apple blossoms. The fruit is esteemed by some to be the best fruit the island produces, though I should place it below two or three others. The peculiar enlarged peduncle (footstalk) which supports the nut of the cashew (Anacàrdium occidentàle) is termed incorrectly, by some, its fruit. Of this the negroes are said to be fond, and it is esteemed healthy. Grainger calls it in his poem

'Thrice wholesome fruit, in this relaxing clime.'

It may be thrice wholesome, but for my own part, I did not care to taste it twice. Once was enough; for it drew up my mouth so that I could hardly open it again. Considering, therefore, the somewhat troublesome qualities of both nut and pulp, I should conclude it was much better fruit to look at than to eat. It is proper to add, however, that the pulp makes a good sweetmeat."

"The luscious and tropical pine-apple, (Ananassa Sativa) is described as a plant in appearance, low and ragged; its long thorny leaves warn you to be careful in your approaches. There are several varieties. A kind grows wild in Cuba, which is highly scented and flavored, but very acrid, and seldom eaten, except in some prepared form. The golden yellow, sugar loaf kind, when fully ripe, is as healthy as it is exquisite. We very seldom get the imported fruit in any thing like perfection; it is either a poor

sort, or gathered unripe. Among the several kinds of Citrus, mention is particularly made of the shaddock, Citrus decumàna, growing to a great size, and of equal beauty to the tree which bears it, is spreading in its form, and when thickly laden with its glittering and gigantic fruit, is a magnificent sight to behold."

"To the gorgeous and elevated palms belong the Cocoa, so useful to man in the employment of its various parts, whether in the fruit or the tree itself. The trunk of the cocoa rises to a hight of fifty or sixty, and sometimes even ninety feet, of a uniform thickness. At the summit of this trunk is a waving tuft of dark green, glossy, pinnate leaves, from ten to twenty feet in length, like gigantic plumes; and just under this tuft are suspended the nuts in long bunches, of all ages and sizes. The trunk easily supports their weight; for though slender, it is very tough and strong, being composed of hard fibers, closely compacted together. When the sea or the land breeze is passing through a group of these trees, and the light is glancing from the leaves, which are all alive and trembling for joy, and the nuts are clattering on their stalks almost articulately, it is something to contemplate by the hour, and to be repeated by the memory through a life time."

Besides the foregoing, familiar notice is taken of the following, as interesting to the horticulturist as the botanist: They are Anona, called by the Malays *manoa*, and at Banda *menona*, which it is presumed that the Europeans have corrupted into Anona. As the word signifies in Latin, food, it has been adopted in this sense, because of the habitual use made of the fruit by the Americans. The species are, for the most part, fruit trees, with soft, pulpy, subacid berries, sometimes as large as an orange, but generally more like a plum. Anona Muricata is common in every savannah, flowering in the spring; the large succulent fruit is agreeable to new comers, and over-heated habits; but it is so common, and so much in use among the negroes, that it is now hardly ever used among the better sort of people. The smell and taste of the fruit, flowers, and whole plant, resemble very much those of black currants. A. Tripetala is a large tree, with large, bright green leaves. The fruit is oblong, scaly on the outside, and of a dark purple color when ripe; the flesh is soft and sweet, and has many brown seeds intermixed with it, which are very smooth and shining. It is esteemed by the natives as one of the most delicate sorts. A. palustris grows wild in marshy places, and bears a sweet-scented fruit, of no disagreeable flavor; but it is said to be a very strong narcotic, and is not eaten on that account. It is called alligator apple. The wood of the tree is so very soft, even after it is dried, that it is frequently used by the country people instead of corks, to stop up their jugs and calabashes; besides these, are the Anona Squamosa, reticulata, (custard apple,) glabra, &c.

Anòna cherimòlia. The Cherimoya is a large clumsily-shaped fruit, irregularly conical, having the pointed end opposite the stalk; that is to say, the reverse of that of the pear. Some specimens are nearly globular. When ripe, the skin of this fruit is yellow, with or without a blush of red. Cut or break it open, for it is quite soft, and you come to a white, creamy pulp, filled with black seeds, resembling those of the watermelon, smaller, but not so flat. The consistence of this pulp is that of a soft custard, or a rich and smooth ice-cream; and it tastes as much like an ice-cream, very slightly flavored with strawberry, as any thing I can think of, though I do not mean to say that it is as good. By some, who have eaten the cherimoya in South America, it is vaunted as being superior to the pine-apple. Others, however, who have also eaten it there, do not think so much of it, and assert that a fine pear is to be preferred to it. Very probably it is better in certain parts of South America than in the West Indies, but to compare it any where with the princely pine-apple, must be nonsense. It is, nevertheless, as I have seen and tasted it, a luscious fruit, of which one may easily become fond. It is eaten with a spoon, the skin of the fruit forming the custard cup; and there is more food in one fruit than any but a hungry man would care to eat at once. The tree is about the size of a peach-tree, and the foliage is also like the leaves of the peach, and exhibits the scattered appearance which is common to the Anona genus; the fruit stalk is thick and fleshy.

Cárica papàya.—The Papàya, or Papaw. This is but an ordinary food for eating, but it grows in a picturesque manner, and belongs to a plant which in several respects is quite remarkable. The tree has a straight, slender trunk, marked with parallel rings or scores, like many of the palms, and rises to the hight of about twenty feet. At the top is a broad tuft of palmated leaves, resembling those of the Palma Christi, or castor bean, very large, and held by long footstalks which branch out horizontally, like the sticks of an umbrella. Immediately under this canopy, just where the footstalks diverge from the tree, the fruit, of the shape and size of canteloupes, are clustered regularly and closely round the trunk, to the number of twenty or thirty, and packed together like a bunch of grapes. Grainger compares the cluster to a necklace. The tree grows very rapidly, and the trunk is spongy and hollow, so that in some of the Islands it is common to say of a specious, hypocritical person, that he is 'as hollow as a papaw.' When ripe,

the fruit is yellow striped with green, and smooth on the outside. The flesh is also yellow like a muskmelon, and tastes like a poor specimen of that fruit, or like a ripe cucumber. The interior contains a large quantity of oval seeds, of the shape of pepper corns, rough, black, and tasting like pepper grass, or the seeds of the nasturtium. The male and female flowers grow on separate trees, and it is therefore only on the female trees that fruit is to be found. Magnificent plants of both species, twenty feet in hight, and twelve in diameter, existed in the Green House of the subscriber, and bore flowers and fruit for many years, 'till killed by the severe cold of 1849. The fruit when about half grown, was soaked in salt and water to get out the milky juice, and pickled as mangoes, for which they are a good substitute.

The papaw flourishes in both the Indies. St. Pierre gives it a conspicuous place in his tale of Paul and Virginia; causing his heroine to plant some of its seeds, one of which produced fruit in three years. Grainger characterizes it in his poem, as the

—'quick papaw, whose top is necklaced round
With numerous rows of parti-colored fruit.'

But the most remarkable circumstance connected with this tree, is the property ascribed to its juices of acting powerfully on animal matter, so as to make tough or newly killed meat perfectly tender. It is asserted on good authority, that this singular effect is produced by washing the meat with the milky juice, or by mixing a portion of the juice with the water in which the meat is to be boiled, or even by hanging the meat on the tree, and thus exposing it to its exhalations. Living animals, moreover, are intenerated by eating the spoils of this persuasive and affecting plant. 'Even old hogs and patriarchal cocks and hens, if fed upon the leaves and fruit, are made in a few hours as tender as young pigs and pullets.' So says Barnet, in his 'Outlines of Botany.' The juice has been preserved and sent to Europe, where it has been subjected to chemical analysis, and found to bear a close affinity itself with animal matter, as is the case also with some of the fungi. I was unacquainted with these facts when in Cuba, and therefore did not verify them, and do not state them of my own responsibility; but I have no reason to call them in question.

Chrysophyllum camito.—It is called by the Spaniards *caimito*, and by the French *caimite;* a pretty name, which ought to supersede the English *Star-apple.* It belongs to the order Sapotaceæ, and like its congeners, Achras and Lucuma, abounds in a milky juice. The tree is spreading, and of moderate size. The leaves are dark green above, and downy beneath. The flowers are in small bunches, of a purple hue. It is one of the handsomest of fruit trees, both within and without. One of the varieties is of a regular conical or top shape, the stalk being at the large end or base of the cone; with a smooth, polished, dark purple skin; about the size of a large apple. The skin, though tolerably thick, is tender. If you cut through the fruit transversely, there is the figure of a star in the center or core, just as there is, only less decidedly, in our apple and pear; and from this appearance it has derived its English name of *Star-apple.* Broad, plump, black seeds, flattened on the sides with a scar as in the sapotilla, regularly disposed, and surrounded by a tough gelatinous substance, form the nucleus of the central star. Nothing can be richer than the pulp itself. It consists of innumerable fibers, of a sumptuous purple color, intermingled with veins of a thick white cream, which is continually oozing out. It may be likened to a mixture of strawberries and cream, and, though it possesses not the high flavor of that compound, it is very pleasant, sweet and good. But it should be eaten fully ripe, in order to be properly appreciated. I have described the purple conical variety. There is another variety, which is like it in all respects, except that it is globular instead of cónical in form. I have also seen two varieties, one of which is globular, the other conical, which have a green skin and a white pulp, and are smaller than the purple varieties. There may be other varieties still, some of which may deserve to be ranked as species.

Citrus Aurántium—Naranja in Spanish; *Orange* in French and English. All sweet oranges are reckoned by botanists as varieties only of this one species. It is not indigenous in Cuba, but the variety which grows there, and which goes under the name of the Havana or Cuba Orange, is one of the very finest of its kind. It is to be remarked, also, that of this variety there are sub-varieties; so that in an orange grove, where all the fruit is rich and sweet, there will probably be two or three trees which will be your favorites, on account of the superior flavor of their produce. Observe, too, that the blossom end of an orange, or end opposite the stalk, is the sweetest; and where this is in such plenty, that quantities are decaying under the trees, you can well afford to eat only the blossom end, and cast away the rest. The orange, certainly, has not so high and exquisite a flavor as the pine-apple; but its sweet and healthful juice is so abundant and so refreshing, it retains its spirit and soundness so long, and offers itself so liberally to all classes, in all climates, that I am disposed to think it the most valuable, not only of the West Indian, but of all fruits.

Jambósa Vulgaris, or *Domestica.* The Spanish name is *Manzana de rosa,* or *Poma Rosa,* or *Jam rose;* the English, *Rose-apple.* The tree is one of the most beautiful in Cuba, large and spreading, affording a fine shade. The leaves are ample, oval pointed, firm and

glossy. The blossoms are large, white, and of pleasant odor, and their stamens are so long and numerous that they look like tassels. They are gigantic and fragrant myrtle blossoms. The fruit is round, or oval, and carinated; has a smooth skin, and is cream colored without and within. The pulp is of rather a firm consistence, sweet to the taste, and possessing a decided odor of roses, from which last circumstance it derives its common name. It contains one or two seeds. These are round, with a rusty coat and a green meat, which is also of a rosy fragrance, but is said to be poisonous, or at least very unhealthy. The fruit is eaten when fresh, and, though it is palatable, it is regarded as being somewhat indigestible. When preserved it is quite nice, and as innocent as most preserves are. The fresh fruit I did not see; but the tree and blossoms I have often seen and admired. It is of the natural order Myrtaceace, and was formerly included under the genus Eugenia. The generic term Jambòsa is derived from the word *Shambu*, or *Jambu*, which is the Malay name for the fruit.

Lucuma Mammosa.—One of the order of the Sapotacaæ, and formerly an Achras. It goes by several names, among which are *Sapóte*, *Mammee Sapóte*, *Mamey Colorado*, *Bully-berry*. The tree resembles others of the same order. The fruit is of a conical form, covered with a rough, thick, brown skin or rind; looking like the entire meat of the cocoa nut deprived of its husk and shell. The pulp is of a very dark orange or flame color, granular, rather soft, but not juicy, tasting like a pretty good common musk-melon. In the midst of the pulp is a long, boat-shaped seed or stone, sharply pointed at both ends, of a mahogany color, and high polish, except where this color and polish is interrupted by the rough scar which occupies about a third of the surface, from end to end. The whole size of the fruit is from three to six inches in length, and from two to three in thickness. Sometimes there are two seeds in one fruit, always polished and beautiful, and of large size. There is also a variety of the Sapote, which is oval, and not conical. But I describe the fruit as I saw it in the market of St. Jago, where it is quite common.

Mammea Americana.—This fruit, as its name imports, is a native of America. It is commonly called the *Mamey of St. Domingo*. The French also called it *L'Abricot de St. Dominique:* and by the English it is often termed *Mamey Sapote*. If the unlearned Europeans who go abroad and settle in foreign countries, had not by nature a beautiful way of confounding natural objects together, they would never have thought of bestowing the same name on this fruit which they give to fruits of the Sapotaceous family, which but distantly resemble it. The Mamey is classed with the Garciniaceæ. Among the umbrageous fruits, the Mamey takes the first place. It is a grand leafy pyramid, attaining the hight of sixty or seventy feet. The leaves are quite large, nearly a foot in length, of a long oval shape, dark green, leathery, polished and shining. The trunk is stout, and gives excellent timber. No one can behold this tree, towering in the fruit garden, without a sentiment of respect. Grainger, speaking of those trees which will best exclude

'With their vast umbrage the noon's fervid ray,'

pays a due tribute to this majestic plant, while he notices a native superstition concerning its fruit.

'Thee verdant Mamey, first her song should praise;
Thee the first native of these ocean isles,
Fell anthropbagi, still sacred held;
And from thy large high-flavored fruit abstained
With pious awe: for thine high flavor fruit
The airy phantoms of their friends deceased
Joyed to regale on. Such their simple creed.'

Large and high flavored the fruit certainly is, but much too solid in its texture, one would think, to be a proper food for 'airy phantoms.' It is noble in its size, as large as a shaddock, or as one's head, globular, with a protuberance or mamelon at the end opposite the stalk, and covered with a russet skin. The pulp is of a close and firm consistency, like that of our quince or cling-stone peach, and of a yellow color. The flavor also resembles that of the peach, though it is more aromatic. It is eaten in its fresh state, but more commonly as a jam or marmalade, in which form it is one of the most exquisite of preserves. Rogers, in his 'Voyage of Columbus,' introduces more poetically than Grainger, the idea of the natives respecting the fruit eating shades of their friends:

'These odorous lamps adorned the festal rite,
And guavas blushed as in the vales of light,
There silent sat many an unbidden guest,
Whose steadfast looks a secret dread impressed;
Not these forgot the sacred fruit that fed
At nightly feasts the spirits of the dead,
Mingling in scenes that mirth to mortals give,
But by their sadness known to those that live,
These met as erst, within the wonted grove,
Unmarried girls and youths that died for love;
Sons now beheld their ancient sires again,
And sires, alas, their sons in battle slain!'

The Spanish author, however, Peter Martyr, quoted by Rogers in a note, makes the Guanabana, and not the Mamey, the favorite food of spirits. 'They eat of the fruit called Guanaba.' In the center of the fruit is a stone or seed, of size corresponding to the fruit, brown, and very shaggy. Within the rough shell is a large meat, of the peculiar bitter taste of the peach stone meat, but more delicate, which is much used for the flavoring of noyeau and other cordials. Sometimes there are two of these stones, and sometimes three.

Mangifera Indica, or *domestica*. The celebrated *Mango* is now quite common in Cuba, though it was introduced from the East Indies not many years ago. Grainger never mentions it in his poem, which is proof that he never saw it, for it is not a fruit to be passed over. Hughes, in his history of Barbadoes, speaks of a young tree which had just come into bearing, as of a great novelty in that island, and gives a plate of it, which is barely tolerable. I have seen young men who have told me that, within their memory, the Mango was a scarce fruit in Cuba, being sold in the market for a *medio*, or the sixteenth part of a dollar apiece. The same money will now buy almost any quantity you may want to eat. The climate and soil of the country have agreed with the trees so well, that in some places they have multiplied spontaneously into groves and even forests, and they bear in the greatest profusion. The tree is one of the most beautiful of fruit trees. The leaves are long, lanceolate, polished, hanging in dense masses of dark green foliage,—so dark, that the orange trees look quite light by their side. The trunk is sturdy, and the branches spread equally, giving a full, regular, rounded form to the whole tree, which is about the size of a healthy and well grown apple-tree. The blossoms are small, whitish, or with a red tinge, growing in upright spikes. When the fruit is formed, the spikes are reversed by its weight, and the mangoes appear among the leaves in long pendant branches. While the fruit is young, its color is a fresh and lively green, which is a treat to one's eyes. When it ripens, it generally turns yellow, and looks like a first rate egg plum, only twice as large. Some of the varieties are yellow, with a red blush on one side, and some hardly part with their green. The flesh is quite yellow, and quite juicy. The juice is thick, creamy, and luscious, and, together with a rich sweetness, possesses a peculiar aromatic flavor, resembling that of turpentine, which in some species is so strong as to be disagreeable to the uninitiated. This thick juice composes nearly the whole of the fruit, which may be sucked away into the mouth, so that nothing but a stone and a mass of fibers will be left. The stone is long, compressed, boat shaped, without polish, irregularly grooved, and covered with hairs or fibers, which penetrate the fruit, and cause it to adhere closely. There are a vast many varieties of this fruit in the East Indies, and there are several in Cuba. The French names of some of them are *Mango filandreaux*, *M. savoneux*, M. abricot, M. coeur. Of these, the Mango coeur, or Heart Mango, is much the best, and is also one of the largest. It is more delicate, and has less of the turpentine flavor than the others. It derives its name from its shape. Though the Mango tree is ornamental, and its fruit is so fine, it is thought by some planters to be for their interest not to suffer it to grow on their estates. The trees, they say, shade their coffee, and the fruit is prejudicial to the health of their negroes, who are very fond of it, and apt to eat it immoderately. With regard to the coffee, it is a pity, indeed, if a few bushes can not be given up for the sake of the shade and ornament which the Mango affords; and, with regard to the negroes, it is held by other planters that the fruit is good for them, and does them no manner of harm. I suspect that the whole question of benefit or hurt, depends on the moderate or immoderate use of the fruit.

Musa. Two species of this genus, the *Musa Sapientum*, or *Banana*, and the *Musa paradisiaca*, or *Plantain*, are cultivated in Cuba, as in most tropical countries. The Spanish name for both the banana and plantain, is *Plantano*, while the French name for both is *Banane*. It is common, however, in the latter language, to distinguish the banana by calling it *Figue Banane*. The Spaniards, according to La Sagra's catalogue, apply the term *Plantano hembra* to the plantain, and *Plantano guineo* to the banana. Some botanists regard them as varieties of the same plant, and not distinct species. However this may be, it is convenient to speak of them as distinct species, and there are certain slight marks which distinguish them from each other. The stem of the M. Sapientum, or banana, is spotted with purple; that of the plantain is uniformly green. The fruit of the banana is smaller and more delicate than that of the plantain, though perhaps the latter is more in request as an article of food. The fruit is daily seen in the markets of our southern cities. It is, therefore, unnecessary that I should describe it further than by saying that it is of a long oval shape, somewhat curved, pointed at the ends, of a yellow or purplish color when ripe, and of a sweet luscious taste. The outside skin readily peels off lengthwise, and the rich pulp that presents itself, of the consistence of butter. It is eaten raw, or cooked in various ways. The stem of the plant is not woody, but consists of the footstalks of the former leaves wrapped round each other, and it rises to the hight of twelve or fifteen feet. The leaves are very large, of a long oval form, five or six feet in length, and of a beautiful green. The middle rib of the leaf is tough and strong, but the rest of its substance is thin and delicate, and is easily torn by the wind alone, in a direction of right angles with the rib. The manner in which the fruit is developed is quite interesting. From the midst of the leaves, and at the top, appears a large, smooth, purple cone, hanging down gracefully at the end of a stalk. The flowers are all wrapped up in

this cone, which consists of a large number of closely packed spathes. By-and-by the uppermost of these spathes disengages itself from the rest, curls up, and discloses a spiral row of three or four long blossoms, with the young fruit of each beginning to form. While this row of fruit is tender, the spathe remains hanging over it like a roof; but when the fruit has acquired some size and strength, the protecting spathe drops off, and the next in order rises up, with a similar row of young fruit, over which it stands in the same watchful attitude, till it also drops off, to be succeeded by another. When one circle of fruit is completed, another is commenced below, and in due time another; while the common stem around which the fruit is disposed, grows constantly longer, and the cone of spathes is constantly diminishing in size, till it is all unfolded, and a monstrous bunch of bananas is finished, which seldom weighs less than twenty and thirty and sometimes as much as seventy and eighty pounds.'

Of all kinds of vegetable nutriment, the banana is perhaps the most productive and most easily raised. After a plant has produced its bunch of fruit, the stem is either cut, or is suffered to wither and fall on the spot. In the former case it is good fodder for cattle; in the latter, it is good manure for the young shoots which have been springing from the roots, and which are soon ready to bear fruit in their turn. From these shoots or sprouts the plant is propagated. There are several varieties both of the plantain and the banana. The banana which comes from Tahiti is among the very best. The East India name for the genus is *Pisanq*. This fruit is not forgotten by Grainger.

> 'A wholesome nutriment bananas yield,
> And sunburnt labor loves its breezy shade:
> Their graceful screen let kindred plantains join,
> And with their broad vans shiver in the breeze.'

Passiflora. The seed vessels of several species of the Passiflora, or Passion flower, are palatable fruits in countries where they come naturally to perfection. This fruit is called *Grenadillo*, or *Passionario*, by the Spaniards, and *Grenadille* by the French; which name has also been adopted by the English, with a slight difference in termination, who call it *Granadilla*. The Spaniards of South America, however, and perhaps also of Mexico, give quite a different name to this class of fruits, terming them *Parchas*. With one species of the granadilla I became well acquainted, for it grew just by my window. The plant, which was, I believe, the *Passiflora quadrangularis*, was a most luxuriant vine climbering over a wild orange tree, and so completely enveloping it as hardly to suffer a twig to make its appearance. Its growth is so rapid that it could almost be seen, and, as it grew, it threw out fresh flowers, while hanging about in all parts of this natural arbor was the fruit in all its several stages up to ripeness, when it was the size of a canteloupe melon, say seven or eight inches by four. It was of an oval form, smooth like an egg plant, and of a yellowish green color when ripe. Within a tender rind a quantity of blackish seeds swim in a transparent mucilaginous pulp, of a rather pleasant sub-acid flavor. This pulp is made into a refreshing drink, when mixed with sugar-syrup and water; but without preparation it was not much to my taste. Surrounded as I was by other and better fruits, I hardly ever thought of reaching forth my hand to this. Grainger pays a due compliment to the ornamental character of this plant:

> 'The muse might teach to twine the verdant arch,
> And the cool alcove's lofty roof adorn
> With ponderous granadillas.'

The Passion flowers give their name to the natural order Passifloraceæ, and are nearly allied to the gooseberries and currants."

'*Persea gracissima*, formerly *Laurus Persea*. No fruit enjoys a greater wealth of names than this; and it is rich in more senses than one. It is the Alligator Pear of the English, which name, Alligator, is only a corruption of the *Avocato* or *Aguacate* of the Spanish, or Avocat of the French, a name which well designates its quality. In Peru and Mexico it is most commonly called *Palto* or *Palta;* and Grainger gives us yet another, which he says is the Indian, where he terms it in his poem the 'rich *Sabbaca*.' But in another place he employs the more usual appellation:

> 'And thou green avocata, charm of sense,
> Thy ripened marrow liberally bestow'st.'

The tree is of middle size, looks so much like our Sassafras tree (Laurus sassafras), that it might easily be mistaken for it at a little distance. In this resemblance it is true to its family connection; for it is one of the Laurels, and it is therefore closely allied with the sassafras, as well as with the bays, the cinnamon, and the camphor. The fruit looks like a very large, long pear. It is of two or three varieties, red, purple, and green, of which the green is best. The pulp is yellow, and of a firm but very rich and delicate consistence. When ripe, 'says Grainger in a note,' the skin peels easily off, and discovers a butyraceous, or rather a marrowy-like substance, with greenish veins interspersed. Being eaten with salt and pepper, or sugar and lime juice, it is not only agreeable but highly nourishing; hence Sir Hans Sloane used to style it 'Vegetable Marrow.' It was once thought to be worth a voyage from Europe to the West Indies to taste of this fruit; but now, its ancient fame is somewhat diminished, though it is still considered a great delicacy. It seems to have the character of a vegetable rather

than a fruit, and it is more highly appreciated by some palates than by others.

As the Aguacate does not ripen till summer, I had not the opportunity of giving it a trial. I saw many of the trees, however, and some specimens of the fruit which had attained a large size. Imbedded in the pulp is a large rough seed or stone, the juice of which stains a violet color, and is sometimes used for marking linen.

Psidium. Of this genus, which is of the natural order Myrtaceæ, two fruit bearing species are commonly mentioned as belonging to Cuba: the *Pomiferum* and *Pyriferum;* the fruit of the former being shaped like an apple, and of the latter like a pear. It is the *Guava*, or, as it is variously written by the French and Spanish, *Guiava*, *Gouyava*, *Guayaba*, Goyabe, &c. The tree is small, looking something like our cherry tree when young; though the leaves of the Guava are larger and longer than those of the cherry, and more thinly scattered on the tree. It is natural to Cuba, and is of a pertinacious life; covering and usurping the ground in which it is permitted to settle. The wood is close grained, heavy, clothed with a smooth, reddish colored bark. The blossom is white, and resembles a plum or cherry blossom, or, more nearly still, a large myrtle flower. The fruit, which makes such a fine and celebrated jelly, is not so very desirable in its natural state, though by some it is esteemed. I happened to see but one species, but of this one I saw many specimens. The fruit was nearly round, and, when ripe, of a greenish yellow, resembling more nearly a ripe lime, as I thought, than either an apple or pear. It was so like a lime, both in shape and color, that, at a little distance, I should easily have mistaken it for that fruit. It had a tender rind, about a quarter of an inch thick, within which was the pulp, of a pink hue, crowded with small, triangular, yellowish seeds. The flavor of the fresh fruit is like that of the jelly made from it, but much more powerful, so that one of them, cut open, will scent a large room. Grainger has but a line and a half to spare for it:

> 'A wholesome fruit the ripened guava yields,
> Boast of the housewife.'

The name Psidium is from the Greek *Psidion*, which was the ancient name for the Pomegranate, to which the guava has some resemblance. There is a wild guava, *P. Montanum*, the fruit of which is small, and not fit for food.

Punica granatum. The *Pomegranate* grows well in Cuba, but is a native of the old world. It flourishes abundantly on the northern coasts of Africa, especially in the Carthagenian district, from which country it derives its generic name. The ancients called it *Malum Punicum*, or the Carthagenian apple. Its specific name appears in the English *Pomegranate*, or apple full of seeds, and also in the French *Granade*, and the Spanish *Granada*. The tree, or bush, is common throughout the Southern States, and the fruit is for sale in our markets. I will only say of the former, that it resembles in appearance, as it is also naturally allied with, the bushy plants of the order Myrtaceæ; and of the latter, that it is round in form, terminated with a tall and deeply cleft coronet, and full of small seeds which are inclosed separately in portions of a transparent red pulp, firm, glistening like rubies. These grains furnish a refreshing juice in which sweetness and acidity seem blended in equal proportions. I have seen the plant occasionally in the city of St. Jago, lighting up some small yard with its fresh and varied beauty, and also flourishing here and there on a plantation walk. The ripe fruit, sometimes bursting and disclosing its gems, the shapely green fruit, the rich red blossoms, all hanging together on the slender pensile stems of the bush, form one of the pleasantest of garden sights.

Tamarindus occidentalis—the *Tamarind*. I have employed the specific name *Occidentalis*, because it has been adopted by late botanists to distinguish the West Indian tamarind. As it seems to differ, however, from the *Tamarindus indica*, or East Indian tamarind, in no other respect than merely having shorter pods or fruit, it hardly deserves to be esteemed but as a variety of that species. It is one of the Leguminosæ, and the tree has all the appearance of a fine, spreading acacia. It grows fast, and yet is long lived, and its wood is hard and durable. The fruit is a pod, like a full, ripe pea pod, with a thin, crisp, russet skin or shell, which covers a reddish brown pulp, and shining mahogany colored seeds, which are embraced by a net of tough fibers, proceeding from the foot stalk. The pulp seems to need no preserving process, for when fresh, it has all the appearance of a marmalade. When eaten fresh from the tree, its sugared acidity is agreeable to the palate and refreshing to the senses. Steeped in water, it furnishes a cooling and grateful drink in fevers. The old writers are loud in its praise, and ascribe to it, together with its real good qualities, properties which it can lay but slight claims to. The least that Lemery says of it, is, that 'it allays by its sharpness the too great motion of the tumors, abates feverish heat, cools and quenches thirst, strengthens the stomach, creates an appetite, resists vomiting, and cuts tough phlegm.' At any rate, it is pleasant and innocent, and is so common to be met with in our shops, that there is no want of an opportunity to test all the virtues it may have. The beauty of the tree is increased by its blossoms, which hang in bunches, with red and yellow petals, and of an agreeable fragrance. Grainger informs

us in a note, that its name in Arabic is *Tamara*, and that its fruit is good in sea sickness. He thus instructs his muse to celebrate it:

'The tamarind likewise should adorn her theme,
With whose tart fruit the sweltering fever loves
To quench his thirst; whose breezy umbrage soon
Shades the pleased planter, shades his children long.'

And another and far higher poet, in that strange and beautiful romance of 'Thalaba,' introduces the maid Oneiza proffering a draught of tamarind water to the guest of her father's tent, unconscious that this guest is a concealed sorcerer:

'The damsel from the tamarind tree
Had plucked its acid fruit,
And steeped it in water long;
And whoso drank of the cooling draught,
He would not wish for wine.
This to the guest the damsel brought,
And a modest pleasure kindled her cheeks,
When, raising from the cup his moistened lips,
The stranger smiled, and praised, and drank again.'

The following curious account of the derivation of the name Tamarind, is from Burton's Outlines of Botany: The date, called *Tamar* by the Arabs, being their most common and valuable fruit, others important have been called dates, or *tamars* likewise, with some distinctive epithet adjoined. Hence the one in question received the name of *Tamar hendi*, the date of India, whence our word *Tamarind*. Ignorance or neglect of this circumstance led botanists to add *Indica* as the specific name, to a generic one in which the habitat of the plant was already included. 'Considering, therefore, that *Tamarindus Indica* is a vile pleonasm,' Burton proposes to call it *Tamarindus Orientalis*, in distinction from the *Tamarindus Occidentalis*.

Theobromo Cacao. This is the plant which produces the cacao, or chocolate of commerce; and it is important that the true spelling and pronunciation of the word should be attended to and preserved, in order to prevent the confusion arising between this and the *coco* or *cocoa*, which is as different a fruit as possible. The nut from which chocolate is made, is the *cacao*, and not the *coco;* and the tree which bears it, instead of being one of the palms, is classed among the mallows, and is connected with the cotton shrub and tree, the linden and other plants of that type.

'The tree is of rather small size, with large, long, oval pointed leaves, strongly ribbed, often assuming a dark purple color. The flowers are small and star shaped. The fruit is of a long oval form, pointed at the end, ribbed like a musk-melon, and bearing some resemblance to a small specimen of that fruit. When ripe, its rind is yellow. Cut open, and you come to a soft, white, spongy pulp, of a rather pleasant sub-acid taste, which separates wholly from the rind. The valuable seeds are wrapped up carefully in this pulp, in separate envelopments, in considerable numbers, and are of a lively red color before they are dried, when they turn to a duller hue, which is well known as chocolate color. A specimen of the fruit I opened contained about thirty of these seeds. A similarity, with respect to this fruit, still more marked than in the case of the guanavana is, that it grows out directly from the bark of the large branches or trunk, hanging thereto by a short, fleshy stem. I have seen it clinging to a stout trunk, within a foot or two of the ground, without a twig or leaf near it. It is unnecessary for me to say any thing of the value of the caçao. When first discovered by Europeans, it was greeted with boundless eulogy, of which its generic name, *Theobromo*, signifying *food for the gods*, is a standing testimonial. In Mexico, and parts of South America, the people could hardly live without their chocolate, or *chocolatl*, which is the Mexican word; and it is calculated by Humbolt, in the year 1806, that twenty-three millions of pounds of the cacao were imported into Europe, the greater portion of which was used in Spain. Chocolate is nothing more than the cacao seeds bruised and ground into a paste, and sweetened and flavored according to the fancy of the manufacturer and demands of the consumer.'

In the South it is a great privilege in being permitted to behold the luxuriant forms of vegetation which Providence has allotted to a tropical climate. The wonderful grace and beauty of the cocoa-nut tree; and the oranges hanging amid dense and glossy foliage the year round,

'Like golden lamps in a green night,'

offering to the thirsty lips their fountains of delicious liquid.

Beautiful, too, are our overlooked and neglected *native*, *indigenous*, and *acclimated products*, *fruit trees* and *shrubbery*—whether in the healing science, or in the arts, and even luxuries of life.

Respectfully,
Wm. DeForrest Holly.

Silicon, or Silicium.—Silica, or silicic acid, is found in small proportion throughout the organized kingdoms of nature. In the animal kingdom it is met with, in trifling quantity, chiefly in the bones and in the urine. In the vegetable kingdom it performs the important office of imparting strength to the stem, as in grasses, so as to enable them to support the weight of the grain. In the stem of the equisetacea, or horse-tails, the silica is seen to be disposed in a crystalline arrangement. In the bamboos of the East Indies there occurs a deposit of pure silica in considerable masses, to which the name "Tabashen" is given, and to which various mystical properties are ascribed.

Ventilation of the Soil.

[Draining the soil appears to be attracting attention more and more widely, as indeed it should, for there is no patent claptrap, nor any quackery attached to it, but the process is commended to the attention of all who can compass it, and all may improve their soils thereby. At a recent meeting of the New York Farmers' Club, this subject was brought forward under a new phasis, that of being a means of *ventilating* the soil. The remarks will commend themselves to the attention of the reader, and should suggest many valuable reflections. Here we find the earth a breathing—not a living creature, as the Indian's legend made it, but a breathing one, nevertheless.]

Mr. R. L. Pell said: at the last meeting I called your attention to ventilation as respects houses and other buildings. I will now speak of it agriculturally. You are all aware of the importance of oxygen in the germination of seed and growth of plants, and that it is necessary it should gain access to all parts of the soil, and to the roots of plants. The farmer facilitates the process by subsoil plowing, harrowing and working it. Still some soils absorb oxygen much more rapidly, and in greater quantities than others. Clay, for example, absorbs more than sand, and peats or vegetable mold far more than clay. This depends upon the porosity of different soils and their chemical constitutions. If the clay should happen to contain manganese or iron in the state of protoxides, it absorbs oxygen to combine with it, while the decaying vegetable matter takes in oxygen to aid its decomposition. Some soils likewise absorb heat much more rapidly than others, the temperature of which often amounts to from 111° to 130°, while the air in the shade is at 80°; black soils are thus affected, and consequently become warm first, and promote vegetation more quickly than others. We possess the power of coloring our soils, and thus gain this advantage where it does not naturally exist, by top dressing with roots, charcoal, or other dark substances, and at the same time render it capable of sustaining heat by a proper admixture of sand, and yet our hopes are sometimes disappointed. I had a piece of land of a sandy nature, situated on an eminence, which, notwithstanding all my endeavors to the contrary, refused to produce me anything more valuable than the detestable fire furze vine, and although there was no portion of my farm that apparently required draining less, I cut a good substantial drain through it, in the fall, five and a half feet deep, and stoned it after the most approved manner, then plowed the ground well, and the following spring sowed oats: the yield was sixty-six bushels per acre. Upon a subsequent examination I found the land contained copperas, which, during the rains of the fall, percolated through the drain, and left the land in a proper state to produce a crop.

Sprengel says, "a soil is often neither too heavy nor too light, neither too wet nor too dry, neither too cold nor too warm, neither too fine nor coarse, lies neither too high nor too low, is situate in a propitious climate, is found to consist of a well-proportioned mixture of clayey and sandy particles, contains an average quantity of vegetable matter, and has the benefit of a warm aspect and favoring slope. It has all the advantages, in short, which physical condition and climate can give it, and yet it is unproductive, because, says chemical analysis, it is destitute of several mineral constituents which plants require for their daily food, or contains some poison that must be carried off by a drain."

Now that I have shown the necessity of oxygen in a soil, I will state my experiment of ventilation, and its results. Two years since, I purchased twenty acres of low swamp land, which had been covered with water for centuries; I cut a main drain through it, and lateral drains ventilated every twenty feet, which carried off the water so perfectly that it became the driest part of the farm. The whole was planted with cabbages and potatos. When they came to maturity, the cabbages growing on top of the drains weighed forty pounds, when those immediately contiguous, in the next row, only weighed twenty. The potatos over the drain were far larger, and twice as abundant, as those in the rows next. A false dry drain was then constructed between two drains, with a view of observing whether the water passing through had any effect upon the growth of vegetation above the drain, and it was found by fair experiment that the result was the same above the dry ventilated drain, and the growth very superior to the adjoining rows.

Draining land aids astonishingly in ventilating it, as water immediately finds its way to the depth of the drain, leaving pores through which the fresh air descends, and rapidly promotes the healthy growth of plants, and renders the earth sweet, loose and friable. Air invariably diffuses itself wherever water has been. The farmer should understand that a deep, well ventilated soil is indispensable to the production of valuable crops, and that the less permeable to air his soil is, the more unwholesome it will be to the roots of his plants. The deeper the soil, the longer it may be induced to grow crops without running the risk of exhausting it, and the greater the variety of

crops that may be grown upon it. Drain your land thoroughly; then use the subsoil plow as an auxiliary to the surface plow and the drain. The surface plow turns over the soil to the depth of nine and a half inches, and the subsoil loosens it nine and a half inches deeper, enabling the water to descend readily, and carry with it the soluble substances it has met with on the surface.

The property of oxygen in its relation to vegetable and animal life is wonderful. It exists in the atmosphere to over twenty per cent. of its bulk, it is void of color and smell, and therefore can not be distinguished from the air surrounding us. Every nine pounds of water contains eight pounds of oxygen. Almost half of all the solid bodies in the world consists of oxygen; it constitutes one-half of all living animals and plants, and on its presence all animal life depends.

Characteristics of Good Vegetables.

In my visits to various exhibitions throughout the country, I have had occasion to notice the general ignorance among exhibitors, as to the true properties of good vegetables, and have taken occasion to advert to this subject and to encourage more attention to the matter, in my reports. The following paper was read before the New York Horticultural Society, where there should be many who appreciate the importance of the subject; indeed, the market gardeners about the great metropolis, and their purchasers, appreciate the difference between good and bad specimens. Would that the committees of our own Society would more nicely discriminate in this matter, we should then have displays of products more deserving of the premiums and of the commendation of the public, than have sometimes made their appearance upon our tables. J. A. W.

It is something to cultivate a good vegetable, to produce an article of food which will bear critical examination, and which can be with safety used as such without injury to the health or fear of evil results. Much information on this subject is furnished from time to time, and there is very little fear of its being overlooked; we have therefore chosen a branch which is not devoid of interest: namely, the points by which a good vegetable may be distinguished from a bad one.

This at first sight may appear a very simple affair, but we know it to be a subject upon which there is a great deficiency of accurate knowledge, and many persons who would not admit that they were deficient in information on this very important point, can not, when they consider the subject coolly, describe the conditions necessary to make up a superior vegetable or fruit. I propose to do so—to enumerate a few principles to guide amateurs and others in the choice of their vegetables, and trust that in doing so our purpose will not be misunderstood. Should our conclusions appear inaccurate or erroneous, we are open to correction; but the necessity of a standard by which such questions as the comparative qualities of vegetables may be decided, has appeared to us desirable, and finding none to meet the requirements of our case, the following is presented.

In agriculture this deficiency has been filled up; the points of a good cow or ox, sheep or hog, are pretty well defined and understood by those whose interests lead them to traffic in those animals; though there may be some little difference of opinion in many instances, yet there is a general understanding upon the more important points. We want a similar agreement upon the subject of vegetables, and the *criteria* laid down in a tangible shape. The advantages which would result from a well-arranged scale, pointing out the desirable qualities of our various esculents, need not now be enumerated—it may, however, be remarked that our horticultural exhibitions lose half their interest when the comparative merit of the various articles deposited can not be judged of by the tenth part of the visitors—no data being furnished by which they might be easily led to draw just conclusions. The judges make their awards, and as their power of approval or rejection is despotic, and the grounds upon which these awards are made no where defined, it can not surprise us that much dissatisfaction is at times to be observed among competitors—judges themselves being found frequently to disagree on the most essential points. We desire then to see the properties of vegetables clearly defined and approved of by the several societies, so that the competitor may know what point he has to reach, the judge have a guide to aid him in his judgment, and the public who take an interest in the matter may no longer remain in the dark as to the proceedings of both. Improved cultivation furnishes us now with the choicest vegetable luxuries, which but a short time ago were either entirely unknown or very rare, and the more common esculents are produced in quantities which astonish the less progressive individuals, who help to make up the great whole of society. Much of this rapid progress may be ascribed to the influence of Horticultural and Agricultural societies. These are exercising a wholesome supervision over those who associate together for mutual improvement, and by co-operation secure advantages which would otherwise be beyond their reach. The taste for such things is spreading rapidly—let us

not rest until the ultimatum of perfection is reached, not only in a few choice specimens from a private establishment, but in all the articles from the garden which are produced in market. In our large cities a fair supply of fine vegetables is within the reach of our citizens, and our exhibition tables are loaded with examples many of which reach perfection. We would desire to define what that perfection is, by describing the various points of excellence as accurately as we can, from the observation of many years spent in close relation to these matters. It need not be concealed that errors are frequently committed in the award of prizes at our exhibitions for want of a proper recognized standard of merit, and it appears to us that such a standard should be adopted for their guidance to be strictly adhered to, and to be put into the hands of each member and competitor, so that they might no longer remain in ignorance of the society or the climax which they had to arrive at. With regard to vegetables, and especially the common sorts, it may be said that any one who knows how to grow a good cabbage knows what a good vegetable is. We contend that this is not so, and that there is as much skill required to judge of a good esculent, or fruit, as of the choicest florist's flower, and that many persons are deficient in this skill who are clever in other departments of their business.

The quantity of nutritive matter contained in plants intended for food, either for man or cattle, has much to do with their superiority. This we can not expect to ascertain very accurately without resorting to analysis, but for practical purposes such is not required. Flavor is an essential point, also, but many persons suppose that size is the most important consideration. Size, however, does not always insure the greatest amount of profit to the producer, or furnish the table with the most necessary condition toward nutrition. It is true, that bulk or weight often bring the highest price in market. Our purpose at present is to direct attention to those more necessary points of excellence which should be found in the productions admitted on our exhibition tables, and should be looked for by the housewife at market. Quality should be the main test for table esculents. In farm produce, size of course demands increased consideration; much depends on the variety under examination. Some have a tendency to grow much larger than others, or to produce a greater yield per acre, and may contain a greater amount of starch and sugar, taking bulk into account. In garden produce, on the contrary, flavor should be the most essential point; next to this texture, and in deciding this, we consider general succulency, with sufficient solidity, excluding stringiness, as our criteria. Over-succulent vegetables are objectionable, as for example in the potato, the good qualities of which are owing to the amount of farina it contains. This is the exception—succulency may be considered the rule. A superabundance of water should be looked upon as a defect, except in the case of those which are used in a raw state, such as salads; even in this class there may be an over supply, so as to reduce the flavor too much, but this seldom occurs.

Form may be considered as next in importance, though in a few cases color may hold an equal position, as for instance in beets and peas. *Size* we consider as last in point of value. In making this observation we do not wish to be considered as discouraging cultivators in adopting methods to produce large vegetables. We speak comparatively and with reference to them as they should be produced on the exhibition tables, or in market. We know that vegetables liberally supplied with manures, and in well worked soil, will always grow larger and generally better in flavor than those under deficient culture. Size of course has its advantages, but we hold them to be secondary to those of *flavor* and *texture*.

Those vegetable esculents, the roots of which are used, may be arranged under the *tuberous*, as the potato and Jerusalem artichoke; *fusiform* or spindle-shaped, as in the carrot, parsnip, and beet; *napiform*, as in the turnip; and *bulbous*, as in the onion, &c.

The First Annual Show of the State Agricultural Society of Connecticut.

Is to be held at New Haven, on the 10th, 11th, 12th, and 13th days of October next. The premiums are liberal, and we think there is public spirit enough among the farmers of that State to lead them to make all necessary exertions to get up a show that will do themselves honor.

New Haven will be a kind of middle, neutral ground, upon which the stock men of New York and Massachusetts can meet without prejudice or special advantage to either. The New York State Show, which is to be of somewhat a metropolitan character this year, will be held in New York city the week previous to the show at New Haven, and if suitable arrangements are made—as we have no doubt there will be—many animals, and other productions, will be taken from the former to the latter.—*Am. Agriculturist.*

Horticultural Exhibition of the Rhode Island Horticultural Society.

The above exhibition was to take place at Central Hall, in Providence, on Tuesday, the 20th inst., commencing at 2 o'clock P. M., and continue open through the day and evening of Wednesday. The show embraces Fruits, Flowers, Early Vegetables, and New Butter in lumps. We learn that extensive preparations were made, and that an unusual display is expected, especially of Roses and Strawberries.

Orchids.

Orchidaceous plants, whether regarded for the beauty of their colors, the singularity of their organization, the grotesque forms which they assume, or the delicious fragrance of their blossoms, must be admitted to be among the most extraordinary vegetable productions of the globe. It is somewhat singular, that notwithstanding the abundance in which they are found, particularly in the tropics, they should have escaped the observation of collectors so long, and equally so, that of those which were brought into Europe, so few of them were preserved for any length of time.

In the early editions of the *Hortus Kewensis*, only fifteen species are recognized, and up to the beginning of the present century, only fifty-one species of exotic Orchideæ are enumerated in our best plant catalogues. Nor was it till within the last ten or fifteen years, that the great influx of Orchideæ has taken place, and that chiefly owing to a few spirited individuals, who, struck with their extraordinary habits and beauty, made them their study, and encouraged their introduction. Amongst the most conspicuous of these is the Duke of Devonshire, who has been most liberal in his encouragement, not only by sending out collectors to discover new sorts, but also by patronizing the cultivation of them at home, on a very extensive scale.

Every year is adding to the number of new species imported, and also to the number of admirers of this grotesque group of plants, so that it has now become as fashionable to possess a collection of Orchideæ as it was at the beginning of this century to possess one of heaths.

The geographical distribution of Orchideous plants is not so very equally divided as that of some other natural orders. For in Europe, and other temperate regions of the globe, they are less abundantly found, and toward the arctic regions disappear, while in and toward the tropics they abound in surprising numbers. In the temperate regions they are, for the most part, terrestrial, growing in meadows and pastures, while within the tropics they are chiefly parasitical, or rather epiphytal, growing upon the trunks and branches of living trees and shrubs, and also upon the trunks of those that have fallen. Some can hardly be said to have any fixed place of abode, and are found forming large tufts, firmly knit together, by their numerous and tortuous roots, and suffering little from being thrown about as the passing kick of the traveler may send them.

A great number of tropical Orchideous plants are found adhering to the branches of trees in the most dense forests in an epiphytal manner, not fixed parasitically by their roots to the bark of the trees that support them. In such situations they are consequently shaded from direct light by the leaves and branches which surround them: they are also placed in a moist atmosphere and high temperature, ventilation and evaporation being almost precluded.

To the fructification of Orchideous plants it may be necessary to make some allusion, inasmuch as it is still but imperfectly known; and although Mr. R. Brown, and a few others, seem to have the production of plants of this order from seeds at their command, still the generality of cultivators have failed in producing similar results, and not a few, otherwise intelligent and accurate in their botanical researches, deem the theory altogether visionary.

The singular plants which constitute this class are distinguished from all others by the anomalous structure of their flowers. These do not, as is usually the case, contain a certain number of stamens, surrounding a central ovarium or style, but on the contrary, are furnished with a solitary, fleshy, undivided process, round which the sepals radiate, and which supplies the place of stamens and style. The nature of this process has been variously explained; the modern opinion is, that it is formed by the accretion of the stamens and style into a single mass, and this opinion seems to be confirmed by analysis and analogy. Omitting, therefore, a notice of such theories respecting its nature, as are opposed to that which is now received as the most correct, it will suffice to explain a little in detail the opinion which is adopted in this work. The central process, called the columna or column, is understood to be formed by the filaments of three stamens surrounding a style, and by mutual accretion firmly united with it, and with each other, into a solid mass. Of these three stamens, it most frequently happens that the *two lateral are sterile*, and not furnished with even the vestige of an anthera, and that their presence is not indicated by more than two irregular excrescences, as in *Orchis*, or by the same number of small appendages, as in *Satyrium*, or by two horn-like or tooth-like processes, present in several of the genera, with waxy pollen masses; it even happens, and not unfrequently, that no vestige of them remains. But in *Cypripedium*, both are fertile, and bear perfect anthers, while the central stamen is barren and foliaceous.

When the lateral stamens are, as above stated, abortive, which is the most common form of the column, the central stamen bears at its upper extremity an anther, which is either movable or fixed firmly in its place. The pollen which this contains, assumes three very distinct appearances in different tribes. It is either granular, dividing into many

separable small pieces, as in *Orchis;* or powdery, consisting of an infinite number of granules, as in *Spiranthes;* or waxy, when it consists of a few large concrete masses, as in *Epidendrum*. The stigma is most frequently concave, and placed nearly under the anther, but in such a manner that there is no contact between it and the pollen. In what way, therefore, fecundation can take place among truly gynandrous plants, is one of those mysterious contrivances of nature which have not as yet been explained. It is generally believed to take place by absorption in some undiscovered manner, before the flowers expand; but it is extremely difficult to understand how this can occur in many genera.

ON THE CONSTRUCTION OF THE ORCHIDEÆ HOUSE.

Orchideous plants require a species of cultivation peculiarly adapted to themselves, and whoever means to attempt their culture, must set apart a structure for the express purpose. The dimensions of an Orchideous house must, of course, depend on the circumstances of the owner, the kind and extent of the intended collection, and some other particulars, that can only be settled on the spot. The form and arrangement, however, may be more positively determined.

The original house appropriated to the growth of Orchideæ, at Chatsworth, (as described by Mr. Paxton, in "Magazine of Botany," vol. ii.,) is seventy-five feet long, and twelve feet six inches wide. The walk is composed of pieces of wood, nailed to sleepers, and is three feet six inches wide. The flues are inclosed in hot-air chambers, and the heat is admitted into the house by means of sliding ventilators on each side of the walk. On the top of the hot-air chambers, the plants are placed: the stones covering the chamber, being always warm, give a gentle heat to the roots of the plants placed on them. The top of the air-chamber is two feet six inches above the level of the floor. The house contains three leaden water cisterns; the two end ones are three feet square, the center one three feet wide by eight feet long, and is occupied with aquatic plants.

There are four fire-places on the common principle: the two end ones pass into the front chamber, cross under the walk in the center of the house, pass along the back chamber, and empty themselves at each end. The two fires in the back wall pass once along the front of the back chamber, and, crossing through the wall at each end of the house, pass along the outside of the wall, and heating the back sheds, empty themselves in the center of the back wall of the house.

The hight of the back wall of the house is eleven feet six inches, and that of the front two feet six inches; on the top of the front wall is an elevation of glass, two feet six inches high, making the front five feet in hight.

In front of the house is a small pit, used for half-hardy plants. The water is conveyed into the cisterns by leaden pipes from a reservoir, and is let on or taken off at pleasure, by turning off taps fixed at each end. For the purpose of readily giving humidity to the house, perforated pipes are passed along it, which, when turned on, throw water on the floor, or over the back chamber.

This house has many advantages; but we would suggest that the green-house species of Orchideæ, as well as the hardy exotic, and even native species, should be kept in the pit in front, and which could be readily heated at one end, by forming ventilators in the front wall of the house, through which a sufficiency of heat would find its way to answer every purpose of preserving what may be denominated green-house species. The North American, and other hardy sorts, would require no other artificial heat than that of the protection afforded by the glass covering, during winter, and sufficient shading during summer. By this arrangement, the whole natural order would be brought together, and be more conveniently attended to than if scattered about in different parts of the garden.

Amongst other vast improvements and alterations going on at Chatsworth, a new Orchideous house has been erected, upon the metallic, curvilinear principle—a circumstance we are rather surprised at, as the humidity usually kept up in houses of this kind will have a great tendency to create rust, and a consequent injury to the plants, from the condensed vapor falling back on them. We have no doubt, however, that Mr. Paxton has taken all necessary precautions to render this house as fit for the purpose as possible.

The span-roofed form of house, however, appears to us to present many very important advantages, and it would appear that some of the best cultivators of the day are of a similar opinion.

The house of Messrs. Loddiges is in length one hundred and forty feet, breadth eighteen feet, and ten feet high in the center. An immense pit, filled up to nearly the hight of three feet above the ground level, occupies the center of the house, and extends toward each end, leaving sufficient breadth for a passage round it. Upon this pit or bed, the larger and taller plants are set. On each side of the house is a platform, nearly four feet wide, occupied with smaller specimens, and under these platforms the hot-water pipes are placed. From the rafters are suspended hundreds of plants, some attached to pieces of wood, others in wire or wicker

baskets, some in pots mossed over, and others having only a little moss tied round them.

The majority are planted in pots, some of which are of very large size, and are intended for specimens; but those for sale vary in size, from the size known as small forty-eights to that of sixteens. The house, notwithstanding its great size, is completely filled with Orchideæ, some of which are in flower at every period of the year.

Few of this natural order attain any extraordinary perpendicular hight: those of them that are disposed to elongate to any extent, do so naturally, or may be made to do so by training horizontally; so that a low-roofed house is the most proper for them, on account of the economy in heating, and that those plants of humbler growth may derive sufficient benefit from the sun, by being placed near to the glass.

The mode of heating may either be by hot water or smoke flues, and the pipes or flues should be under the side platforms, which should be covered with perforated boarding or trellised work, to admit of the ascent of heated air, not only to keep up a genial warmth around the pots, but also to heat the atmosphere of the house with the least expenditure of fuel. On these side platforms the smaller specimens should be placed, by which means they would be brought close under the glass; the larger growing sorts placed on the table or platform, in the center of the house, and which may either be completely level, or elevated in the center.

We consider a cistern of water to be next to indispensable in the Orchideæ house, and would propose to place it under the center platform, so as not to occupy space on which plants could be set.

Orchideous plants are capable of reproducing themselves by seeds, and no doubt this method is constantly going on in nature; but the attempts of cultivators to turn to their advantage this natural property, have hitherto been rarely successful. This is a matter of less regret, as the majority of them are readily increased by the separation of their parts—an illustration of one of the many wise provisions made by nature, namely, that plants which rarely produce perfect seed, are capable of being increased by a variety of other means; and again, such as are incapable of certain multiplication by those very means, as most annuals, and even a great many perennials, produce seeds in the greatest abundance.

In regard to the cultivation of Orchideous plants, we find the following very sensible and useful preliminary remarks by Mr. Paxton, in his very excellent Magazine of Botany: "It is adviseable," says he, "for every cultivator, as much as possible, to learn the native habits and situations of each separate species, in order to insure its successful management. Some species are found in low, dense woods, where scarcely any sun can penetrate; others grow on the trees near the open breaks in the wood, where they receive a little sun, plenty of light, and a free, but damp air; others, again, are found growing on single trees in damp but exposed situations; and others grow on single trees in elevated situations, where they are subject to a dryer air, and the burning rays of a tropical sun. All these kinds are subjected to a time of drought, and a somewhat low temperature for three or four months in the year; the knowledge of which particulars marks out the line to be pursued in the cultivation of the different species.

"The plants of the first kind require shading from the rays of the sun, either by large plants in the house, by creepers, or by some other means, and must have a hot and damp atmosphere.

"Those of the second kind should have a similar atmosphere, but will endure more sunshine than the last. The greatest part of the species come under this head.

"Those of the third must also have a damp atmosphere, and plenty of heat; but they thrive best if exposed to the sun, except just at mid-day; for although the sun in the tropics shines with great power, it must be remembered that the plants receive considerable shelter from the branches of the trees, (although standing single,) on which they grow.

"The third class require a lower temperature, less humidity, and nearly a full exposure to the rays of the sun. The plants of all four enjoy light, a free air, and are subjected annually, for three months or more, to a low temperature and great drought; and it is worthy of remark, that the time of drought, and the decrease of temperature, occur together. This may, therefore, be considered their winter, or time of rest."

Orchideous plants may be considered as terrestrial, or epiphytal; that is, either growing upon the ground, or attaching themselves to other vegetables, rocks, stones, &c.

The latter division is by far the most numerous, and also the most extraordinary in their organization. They also occupy such an extent of latitude, that some distinction must be made in their culture as regards temperature.

EPIPHYTAL, OR PARASITICAL TROPICAL ORCHIDEÆ.

Potting and Soil.—For potting orchideæ, it may be taken as a pretty general rule as to time, that period at which their season of rest expires, or just as they are beginning to show symptoms of growing. Pots for

this tribe should be large, in proportion to the plants, and can not be too well drained; indeed, from one third to one half of the pot should be taken up with drainage alone, of which, broken pots, small pieces of sandstone or brickbats, is the best, being well calculated to absorb a supply of water, which will be given out to the plants as they require it. Indeed, it is a good practice to mix a quantity of similar materials along with the soil in which the plants are to grow.

The soil used by the best cultivators, is what is called turfy peat, of rather a sandy nature, cut from the surface of a moor, or common, upon which water does not lie during any part of the year, and having the surface herbage, and as large a portion of fibrous matter in it as possible. Such a soil seldom requires what is called sweetening, or previous preparation: such as keeping for years piled up to rot, and being frequently turned over during that time. It is, if of good quality, fit for use as soon as it is brought from the common, requiring only to be cut into pieces about an inch square, and mixed with about one third of broken potsherds, to render it still more capable of allowing the superfluous moisture to pass off. For it should be remembered, that no species of Orchideæ will thrive if stagnated water be allowed to remain about their roots.

In potting, care should be taken that the plants be not set too deep; it is better to place them almost on the surface, and to support them with sticks, to prevent their falling over, which may be done in a neat manner, and so as to be scarcely perceptible, by fastening the pseudo-bulbs to the stick, which need not rise above their tops. Care should also be taken in potting, that the fleshy tender roots be not broken, and also that the turfy mold be laid over them in rather an open, loose manner, to allow the roots to find an easy passage through it, as well as the superabundant moisture to escape. Many species of Orchideæ like to be planted on the top of a little pile, or hillock, as it were, formed of turfy matter, considerably above the top of the pot, from whence they will send down their roots in quest of nourishment, while the crown or main body of the plant remains high and dry, and, therefore, safe from the effects of damp.

Some species prefer to be potted in moss, rather than in mold, and the best sort of moss for this purpose is half-decayed *Sphagnum;* but the kinds which prefer this medium to grow in, will succeed equally well if the roots be tied up in bundles of the same material, and laid on a shelf, or suspended from the roof, taking care to keep them sufficiently moist by frequent waterings. Of those which appear to like this mode of treatment, we may enumerate the following, but to them it is possible that many more may be added: *Vanda, Aerides, Vanilla, Sarcanthus, Saccolobium,* part of *Epidendrum,* part of *Oncidium, Renanthera,* &c.

Many species will grow beautifully, if laid or fixed to a piece of rough-barked rotten wood, the rough trunks of palms, on artificial rock-work, &c., according to the fancy or taste of the owner; all that is required being to secure a little moss kept damp to their roots, until they have attached themselves to the material upon which they are placed. The *Vanilla,* and some others, we have observed growing luxuriantly in this way; but it is more a matter of taste, and of displaying their natural habits, than one of nursery culture, as the plants become so firmly attached to the material, as not very readily to be separated from it. The species which admit of this mode of culture, as well as of the last, may be equally well grown in baskets of wicker or wire-work, and suspended from the roof; and in this state, while in bloom, are exceedingly beautiful ornaments to bring into the drawing-room, where they may remain uninjured while they remain in bloom.

The late Mr. Cattley, who was a very successful cultivator of some species, had a box, twenty or thirty feet in length, suspended from the rafters of his stove; this box was filled with decayed wood, and the surface covered with green moss; in this the plants were set, and flourished exceedingly. Such a box, were it extended the whole length of a plant stove, close to the back wall, and at a sufficient distance only from the glass to admit of head-room for the plants, would contain a very pretty collection of Orchideæ, and occupy but little space that could be useful to other plants.

It would appear that the most minute and most delicate species thrive best when fastened to pieces of wood, and suspended; for in this way they are less liable to be injured by wood-lice, damp, or by being overrun by other fast growing sorts. Of the genera which thrive best in this way, we may mention *Ornithocephalus, Stelis, Octomeria, Trizeuxis, Pleurothallis, Fernandesia,* &c.

A few of the most rapid growing kinds, particularly those with long, pendulous branches, like some of the *Dendrobiums,* cultivated in baskets or pots, and suspended from the roof, give the house a very handsome appearance; but they should not be placed over those delicate ones which require little water, because the drip from them would injure those below.

TEMPERATURE AND ATMOSPHERE.

High temperature and excessive humidity, are together the only conditions essential to the well-being of these plants. The hottest

countries, if dry, and the dampest, if cool, are destitute of them; while there is no instance of a country, both hot and damp, in which they do not abound.

In regard to the proper degree of temperature and atmosphere necessary for these plants, we find the following judicious remarks in Paxton's Magazine of Botany: "In the native habitats of these plants, the season of growth and flowering is that called the rainy season, at which time the temperature is high, and the humidity great. But the imitation of such a season in our hot-houses would be very likely to end in loss and disappointment: for although subjected to great humidity (indeed, bordering on saturation,) in their native country, the situation they occupy in the trees prevents the possibility of injury, except in a few instances; whereas, in our artificial climates, the same means used would saturate them, and they would speedily disappear. To imitate to a limited extent the above climate, may be done with benefit; therefore, during the season of growth, never allow the temperature of the house in which the plants are grown to be less than seventy-five degrees, nor greater than ninety-five degrees by day, nor lower than sixty degrees, or higher than seventy degrees by night.

"It is also indispensable that the atmosphere of the house be kept moist in the day time, particularly on sunny days; but toward evening, allow the moisture to dry up, otherwise, when the temperature is decreased, if humidity remains to any great degree, we have found it invariably become *injurious*, and to many small plants *fatal;* but in the morning increase the temperature, and when the house is hot, pour water on the floor, or other situations, to fill the air with moisture."

There are few of the Orchideæ that require water at their roots: indeed, they seem impatient of it, and many plants of this tribe are lost in consequence of an undue application of it, the humidity of the atmosphere in most cases being found sufficient. But when it is evident that water is required to be so applied, it should be administered by pouring it in limited quantities round the edges of the pot, allowing as little as possible to fall on the plant, excepting in the case of the robust-growing kinds, which would be rather benefited than otherwise, by a moderate syringing over their tops.

The following has been laid down by Mr. A. Scott, in a communication to Mr. Loudon, and published in the last edition of the Ency. of Gard.: "The temperature of the stove should be kept, while the plants are growing, at about seventy degrees, but may be allowed to rise by the influence of the sun to eighty degrees, or more, according to the state of the weather. All the strong growing, and many of the handsome species will, if the plants of them be large, succeed and flower better in a low temperature, as will nearly all the terrestrial species. The plants may be syringed once a day in fine weather, and in very warm dry weather, a more frequent syringing, if it be done with care, will be of service to many of the species. As a general caution, be sparing of giving much water to the roots, and keep up a moist heat. During the winter months, the plants may be allowed to become more dry and cool, and this condition will conduce to the flowering of many of the species. If an excess of heat and moisture be allowed, it will cause the plants to produce roots of so delicate a constitution, as to be destroyed by the least declension of these elements. The necessity of supplying moisture will depend upon such circumstances as the size of the house, the distance of the plants from the flues or hot-water pipes, the degree in which the temperature is affected by the action of the sun's heat, or by that of cold winds, or other circumstances connected with the structure and aspect of the house. A sheltered, close, and humid stove, is that which is most conducive to the health and growth of the Orchideæ."

Changing Seed.

Much stress has by some been laid upon the necessity of changing seed. It is true that new varieties are constantly being introduced, of which many will doubtless be found more productive, and better adapted to the climate than the old, yet we deem it a matter of more importance to get *good* seed than that which is new. We have cultivated the same variety of potatos for twenty years on the same soil, and instead of deteriorating, the produce constantly improved in quantity and quality. This end was attained by selecting good sized, sound potatos to plant. The *Worcester Spy* confirms our own experience.

"In a conversation last evening, with Mr. Jonathan Nelson, of this city, well known here as a substantial farmer and a reliable man, he informed me that he helped reap a field of rye, the past summer, of a little less than one acre and a half, yielding thirty-eight and a half bushels of excellent quality; that he has helped reap fifty-five successive harvests of rye on the same farm, owned by his father, (the late Deacon Nelson,) and himself, *that in all that time the seed had never been changed;* that the first of those harvests was from seed raised on the same farm by the former owner, and that he knew not how long the process of independent husbandry had been carried on by his predecessor."—*Am. Agriculturist.*

Editor's Bureau.

Summer Fruits.

These are, the present year, tolerably abundant; and the promise is good for an abundant crop of the fall kinds. To aid in correcting the unhappy prejudice existing in the minds of many against the free use of ripe fruits in this season, we give place to the following paragraph from the London Lancet. Of the wholesomeness, and even curative hygienic qualities, of good, mature fruit, there can be no reasonable doubt. So far from withholding them in cases of simple bowel derangement, they should rather be given as remedies and restoratives. One competent writer affirms that baked ripe apples are a specific for ordinary dysentery; and bowel complaint frequently yields to the natural action of mature acid fruits. Their moderate constant use is beneficial, and really prevents the diseases they are erroneously supposed to produce and aggravate. Be sure, however, that the fruit you eat is ripe, and avoid excessive indulgence. In actual disease, *cooked* fruit is undoubtedly to be preferred: and it is scarcely necessary to add, that fruit for cooking should, in all cases, be as sound, and ripe, and perfect, as that which is eaten raw. Cooked green gooseberries, and green apples, made palatable by syrup and spice, are an abomination, suited to no living stomach. Let all your cooking and preserving fruits be *fully ripe*. Have nothing to do with any that you would regard as unwholesome or suspicious, if eaten in a raw state.

"The prejudice," says Tissot, "against fruits in dysentery, is erroneous and pernicious." He adds: "Ripe fruits of every sort, but particularly summer fruits, are a preservative against this disease." This writer then states that a Swiss regiment in the south of France being attacked with the dysentery, "the officers purchased the produce of several acres of a vineyard, and gave the soldiers the grapes, which cured all those that were ill, and prevented any of the others from being attacked." Curtis states of the European hospitals of Madras in 1782–83, that the medical officers never forbade the use of fruits in the chronic stages of dysentery and diarrhœa, and especially of such fruits as were astringents, as the mango, guava, pomegranate, and a portion of the rind was always directed to be eaten along with them, doubtless with the view to include the astringent property, tannin, contained in the rind, along with the acid of these fruits. Curtis adds, that when personally reduced by chronic bowel complaint, "as ever any European in India, the first turn toward recovery was found by him at the hospitable tables of Vizagapatam, where all the tropical fruits were in plenty." They were, "grateful and useful antiseptics."

The Grape Crop.

Great apprehensions are entertained as to the result of this important product,—indeed, it is already apparent, that although some vine-rows may have a fine prospect for fruit, the general average will be a short one. Many vines have died outright; many are badly furnished with fruitful branches, owing to the frost; and now the mildew, and after it the *rot*, have each left their desolating mark upon the swelling berries. More extensive observations may enable us to give more cheering intelligence, and, if so, it shall be duly reported in the next issue.

The grape-houses, in which the foreign varieties are cultivated, look very promising, and shall be more particularly noticed after a critical survey. It is already demonstrated that this branch of pomology may be pursued with profit as well as pleasure.

Orchids.

The article on the management of this beautiful family of flowers, we trust will receive the attention of amateurs and florists. No more splendid flowers than these can be grown. Their peculiar and remarkable forms, their rich and brilliant color, and their abundant and showy bloom, render them the most attractive and interesting plants of the stove and green-house. And yet how seldom are they seen; how few of them are known. We shall in our August number give a descriptive list of the most desirable species, with some additional hints for their successful culture.

TRANSACTIONS.

The Cincinnati Horticultural Society.

Since the Spring Exhibition, briefly mentioned in the last issue of this periodical, the Society has held many very interesting meetings at their new hall, in the Mechanics' Institute. Fruits of various sorts have made their appearance, and elicited discussion. Among these, we may notice the gooseberries, free from mildew, produced by Dr. Brower, of Lawrenceburgh, Indiana. This exemption is attributed by the cultivator to his method of summer pruning. The premium for early pears was awarded to the indefatigable pomologist, Mr. McWilliams, who is always a prominent contributor, and who has again presented his "yellow June" apples, which we believe to be the true Prince's Early Harvest, though differing somewhat from the printed descriptions in the books, and remarkable for their very short stems, as well as for their excellence. F. C. Ives has surpassed all others in displays of currants. W. E. Mears, presented for Mr. McCormack, a variety of black raspberry, a seedling of merit, which was commended for further trial. Mr. Pinkenstein, from imported German trees, exhibited pears, apples, and cherries, of varieties not recognized by the committee; he also presented the earliest specimens of egg-plants.

Since the Spring Exhibition, the council awarded a silver cup, as an honorable testimonial, to Jno. G. Anthony, one of the original members of the Society, for his unwearied exertions, and valuable services, during the recent exhibition.

The meetings of this Society are a source of great pleasure, and of no little advantage to the members who attend, and mutually contribute to each others improvement in horticultural knowledge. During the last month we have been indebted to our Southern friend, Mr. Hatch, of Vicksburg, for beautiful specimens of pears and apples, which are ripened here in August and September.

Chester County Horticultural Society.

West Chester, Pa., 1854.

Dr. John A. Warder.

Dear Sir—For the information of our western Horticultural friends, you will please insert in "Horticultural Review," the following proceedings of the Annual Meeting of our Horticultural Society. Very truly, &c.,

J. Rutter.

At a late meeting of the Chester County Horticultural Society, (Pa.,) the following named gentlemen were elected officers for the ensuing year.

President.—John Rutter, Esq.

Vice Presidents.—James H. Bull, Esq.; Dr. George Thomas.

Recording Secretary.—Josiah Hoopes.

Corresponding Secretary.—Joseph P. Wilson, Esq.

Treasurer.—John Marshall.

The American Pomological Society.

[The following suggestions as to the approaching meeting of this great national association are worthy of consideration. They are from the *Country Gentleman*.]

We have already published the official announcement of the meeting of this society next autumn at Boston, and from present appearances, it is likely to prove the most important and interesting session ever yet held. Its value, however, will depend greatly on the manner in which it is conducted—or a proper regulation of its machinery. A well directed meeting will accomplish more in a single day, than one confused or irregular, in half a week—a matter of no trifling consequence, when it is remembered that this is a national meeting, held only once in two years, at an expense of time and travel, of several thousands of dollars, and to the proceedings of which the whole country looks with interest.

To come right at the marrow of the thing, the society wants to attain the following objects:

1. To learn from the experience of the best cultivators, the best varieties of fruit for each and for all parts of the country—and the relative merits of various sorts, old and new.

2. To learn the influence of climate, soil, &c., on these sorts.

3. *To ascertain, by well conducted experiments, the difference in the quality of fruits, when subjected to high and to ordinary, or neglected cultivation*—a difference but very faintly appreciated, but which is often greater than all the influences of climate, natural soil, and other causes, put together.

4. To collect important facts relative to the diseases and enemies of fruits.

There may be other objects, but these are the chief. Now the society wants to get hold of the great amount of information which already exists scattered all through the country; and also to incite to new experiments on doubtful points. How this is to be done to the best advantage, will require a great deal of thought, and some discussion, before the occurrence of the Boston meeting. We lately received some valuable suggestions on this subject, from an eminent and well known cultivator in western New York, who strongly urges the importance of ascertaining the soil and culture, as connected with the specimens exhibited, and who adds, "I am quite convinced of the necessity of some such course as this, from the report of the proceedings of the Philadelphia meeting, in 1852, (in which I find nothing satisfactory of the kind I allude to,) and comparing it with the little evening meetings a few of us had at Rochester at the autumnal State Fair in 1851,—at the latter meeting, although but few fruits were discussed, I learned more of what fruits were examined, than I learned at all the other meetings I had previously attended,—Buffalo, Syracuse, and Cincinnati."

We shall suggest a few points in relation to the management of the approaching meeting, by way of contributing our mite to the general

stock of suggestions for the use of the committee of arrangements, as they may choose to make of them.

1. *Three days* is about the utmost extent of time which should be allowed for holding the convention. A week has been proposed—but we have seen enough to know that after the second day has passed, delegates begin to grow restless and impatient, and if extended into four days, it will be found that the sessions have become very thin. It is better to be *too* short, than to weary out delegates, while business is pressing at home. Short, active, and spirited meetings are infinitely better than long, prolix, and prosy ones. If any one does not know this, he will probably find it out the first time he attends a four days fruit convention.

2. Little time need be consumed with preliminaries. A writer in the Horticulturist, with many good suggestions, thinks one whole day will be consumed in receiving credentials, hearing the addresses, and electing officers. We should be sorry if more than *an hour* is thus consumed, of the proper time of the convention.

3. No "speechifying" should be permitted. We want facts—and to get them, the three-minute rule must be adopted when fruits are under discussion—and every one can state briefly, accurately, and distinctly, the results of his trials with each sort.

4. The great fault of nearly all American cultivators is *inaccuracy*. The "*sandy*" soil of a clayey district, would be a "stiff clay" in a very sandy region—hence general designations of the soil are of little use. The soil is "*heavily manured*," but the amount per acre is not remotely hinted at. It is "worked *deep*," but whether eight inches or two feet, we have no means of guessing. The growth of a tree is "*rapid*," but whether the year's shoots are one foot or four feet, it is impossible to say. Can not the American Pomological Society adopt some means, and use some influence, to promote a system of experiments, that shall do it credit for their accuracy, aims, and results?

5. Allowing a certain portion of time to asking and answering questions on fruit-raising, may be eminently useful. For example, a member wishes to know if an orchard of dwarf pears has ever proved profitable in market, and to what extent? Answers to this and other inquiries could not fail to prove valuable.

6. As the reports of the State Fruit Committees always furnish very valuable matter, and as some of our most intelligent and skillful cultivators can not write otherwise than diffusely, the committee on publication should pass them through a winnowing-machine, and give us the pure wheat, that ten thousand readers may not have to go successively over the same laborious task of hunting out the kernels.

One well-grown tree, or one dish of superior specimens of any fine fruit, gives more satisfaction, elicits more admiration, and confers, in our opinion, more honor upon the proprietor than fifty neglected trees, or shabby dishes of fruit.

New York Horticultural Society.

This Society held its regular meeting at its rooms, 600 Broadway, on Monday evening, at seven and a half o'clock, Mr. J. C. Groshan in the chair.

The Committee on Vegetables reported progress. Mr. Hepp presented three designs for Suburban Gardens and Villa Sites of areas, varying from half an acre to thirteen acres. He gave us his views, through Mr. Scott, that in landscape gardening, we should conform to the natural scenery rather than adopt a contrast. That in the grouping of plants and flowers, we must follow nature, or the eye will not rest upon it with pleasure. It can be done only by a philosophic study of nature. Mr. Downing commenced this system, and left it to his students and followers to carry out.

Mr. Parsons read an essay on the instructive and pleasing character of the products of nature, and the importance of cultivating the taste of our children for them.

Mr. Mead concurred with Mr. Hepp in his views as to conforming to nature in laying out grounds, but thought it would be a long while before it could be done in this country. Our merchants retire from business as they are about to die, and at once task themselves with the adorning of a country residence and its grounds, without a knowledge of the laws of nature, and therefore do not follow them. He was glad that agricultural schools were springing up in the land. We need gardeners that understand their business, and to ensure this, let us require of them a certificate of ability from any respectable Horticultural Society, after a thorough examination.

Mr. Hogg, Jr., said that in the laying out of ground, convenience and usefulness should be consulted as much as a pleasing effect. Curved walks, where they are not necessary, and hedging any walk, without it is a screen, are in bad taste. Also making a circular figure, and planting an evergreen in the center. The beauty of trees and shrubs is enhanced by planting in belts and masses, allowing different kinds gradually to intermix. Evergreens mingle well with many other trees, and produce a fine effect.

Mr. Mead suggested that Mr. Hepp, in order to be better understood, should prepare an essay on landscape and suburban gardening, covering the whole ground, to be read at the next meeting.

On motion, it was resolved, that when we adjourn, we adjourn to meet on Friday of next week, at 11 o'clock, at Barnum's Museum.

Mr. Scott announced his inability hereafter to be present and report the proceedings of the Society, when, on motion, the subject was referred to the Committee on Conversational Meetings.

Mr. W. S. Carpenter exhibited a fine bouquet of wild flowers. Mr. Wm. Campton, gardener to Mr. A. H. Stevens, exhibited a fine collection of cut flowers, Hibiscus, Ixias, &c. Mrs. Holbrook, by her gardener, David Scott, exhibited some beautiful seedling Calceolarias. Adjourned.

The American Wine-Grower's Association

Held its regular meeting at the beautiful vineyard of John E. Mottier, Green Township, L. Rehfuss in the chair. The minutes were read and approved.

The members interchanged opinions respecting the present state of the grape crop. The mildew was not considered to be very serious this season, although some have had very serious apprehensions of injury from this source. A survey of the vineyards presented a fine appearance.

Mr. Buchanan stated that his correspondent at Aiken, South Carolina, had promised to send samples of wines, made in a rational manner, without any admixture of sugar or brandy. He presented a sample of the celebrated El Paso wine, of which he had also received and distributed cuttings, sent by Col. McCrea; also, a bottle of wine from native grapes, from N. W. Thatcher, Esq., of Chillicothe, Ohio.

State of the Vineyards—Mildew.—Mr. Yeatman had seen mildew—within a week.

Mr. Werk.—All his closely planted vines had lost one half to three fourths of their grapes by mildew—old compost used—but where his grapes were planted twenty by twenty feet, and trained high, there was no disease.

Mr. Sleath had observed that where he had sunk drains there was no mildew. This was confirmed by Mr. Peticolas, and others, who had similar drains. It was stated, that a part of Mr. Hill's vineyard, on upland, was worse than that in the bottom; this was explained by the principle of drainage, as the bottom land is underlaid by gravel, and the upland by clay. Mr. Hodge had observed very little mildew, and only in flat places, where the water was retained. Mr. Buchanan observed it on the 13th of June, after a fog; it lasted only a day. Mr. Rehfuss found it on the 14th, also foggy weather. In the experience of both these vignerons, it lasted only a day, when the weather became fine. Mr. B., with south-eastern exposure, will lose one fourth, and only one tenth on the south-western slope, where the wind caused a rapid evaporation. It was agreed that the mildew was worse this year, and affected the grape more rapidly than usual, especially attacking the smaller grapes and the weaker shoots.

Mr. Rehfuss had applied coal ashes, which he prefers to wood ashes, on account of the sulphur it contains; he used both, and also a strong solution of sulphuret of potassa; the ashes were applied freely when the leaves were wet. He considered that fine, clear and windy weather was the best cure, as this causes a free evaporation from the plant, and consequent circulation of a healthy character.

Mr. Buchanan had applied sulphur in the hope of benefit The mildew has now ceased. we may next look for the rot. He reported that Col. Waring's grapes were half destroyed. Mr. Hume stated that some vines lying upon the ground were quite free from mildew. Mr. Werk stated that a part of his vines, which had been frozen, had a good crop from the second buds, and that these were free from mildew.

Mr. Buchanan had observed the mildew worst on bunches of the second eyes or buds; also that the Herbemont, a late bloomer, had not suffered. Mr. Werk stated that his European grapes were safe.

Frost.—Mr. Mottier had suffered much from this cause, the first and second crop of shoots were destroyed on many vines—one third or more were thus destroyed. Mr. Yeatman had observed spots where several plants were dead; the cause was unknown. The previous winter was a very trying season, owing rather to the changes of temperature than to the severity. Mr. Buchanan had suffered very little from the frost, but a hail-storm had injured him somewhat.

The result of the discussion was a conclusion, that we should select elevated situations, hill tops especially; that the ground should be thoroughly drained, deeply dug, and planted at wide distances.

Notice was given that the next meeting would be the trial for new wines.

It was agreed that the trial should be had on the fourth Saturday, 22d of July, the samples to be taken from a thirty gallon cask, and brought to the house of the Secretary, or to the store of L. Rehfuss, by or before Friday, 21st of July.

After a very interesting discussion, the members were invited to the tables, where a cold collation was much enjoyed, and where some very fine samples of the native wines were tested with relish, and much approved.

Members Elected.—W. M. Hume, E. D. Hotchkiss, Frank S. Bond.

Adjourned to meet at the vineyard of Mr. Werk, on Saturday, July 29, 1854.

Kentucky Agricultural Association.

The fifth fair of this society will be held at the Fair grounds, in Lexington, Ky., on Tuesday, Sept. 12, 1854, and continue five days. Manufactures, Implements, the Orchard, Garden, &c., will occupy the first day. The time will interfere with that of the U. S. Pomological Society's meeting, at Boston, and thus prevent many of the leading fruit-growers of this region from attending this show

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Delaware County Horticultural Society.

A Society was organized at Delaware, in this State, by the election of A. Thompson, *President*, H. Williams, and T. W. Powell, *Vice Presidents*, Jno. F. Latimer, *Treasurer*, and H. Van Horn, *Secretary*.

There was a fine display of fruit and flowers, among which were the following sorts:—McAvoy's Superior, Longworth's Prolific, Schneicke's Pistillate, Burr's New Pine, Ohio Mammoth, Hovey's Seedling, British Queen, Alice Maud, Rival Hudson, Early Scarlet, Boston Pine, Necked Pine, White Alpine, Willey, and others; also, choice cherries, and superb roses. Success to the Delawares, to whom we are indebted for the delicious table grape, supposed to be the Traminer, a foreign but hardy variety.

Live Hedges in Ohio.

The subject of Live Fences has been brought before the readers of this periodical, at different times during its existence, and their value has been urged with what force we were able to command, but the great importance of the topic, considering the economic, climatic, ornamental, and we also add, the moral influence of good hedges, will now be an ample apology for again introducing the subject by alluding to some of the hedges in this part of our State, among them some that have been often referred to in the communications of writers upon this subject.

That there should be opponents to this kind of fencing is not at all surprising. Those who have been well protected by substantial and massive wooden structures in the forest regions, and who do not yet begin to realize the scarcity of timber that generally ensues with fatal certainty and rapidity where a fertile country is settled and subdivided into small farms, cannot appreciate the waste of valuable material which is incurred, nor understand the necessity for a substitute. Then again it is unfortunately too true, that the opponents of live fences can point to very many failures in the attempts to produce a hedge. These may be seen at every turn, and are enough to discourage the observer who does not also look to the true explanation of these failures, which may always be found in the sheer neglect of the proprietors. The worm fence, half made and left to the winds without stakes, or the post and rail fence, without thorough planting of the posts and fitting of the rails, would be failures as well as the hedge that has been merely set in the soil, which was but half prepared, and there abandoned to its fate, instead of being kept well tilled and thoroughly clipped through the first years of its existence, the period, indeed, of its formation, a hedge, merely planted, is no more a *fence* than the requisite amount of split lumber thrown upon the ground from the wagon, is a fence until it be judiciously laid up in due form and secured with stake and rider; but if properly cultivated and trimmed for three years, the hedge becomes a perfect and beautiful barrier against intrusion, and it will be constantly improving for, perhaps, a half a century, while the rail fence is sinking in value, and will, in a few years, be worthless from decay.

A few instances of more or less perfect success in hedging, which I have recently inspected, will show that the *Maclura* may be grown so as to accomplish the much sought desideratum of a perfect fence.

One of the first objects of this class to which my attention was directed, was an inclosure of a garden and vineyard, including about four acres, the property of William Neff, at the Yellow Springs. This is a complete defence against intrusion; but owing to the non-residence of the proprietor and the prevalent desire among planters too rapidly to attain their object, a high growth, this hedge is unreasonably high, and will be apt to spread its limbs, which are out of reach of the knife, and the consequent failure of the lower branches is to be apprehended; it is, however, at present a magnificent wall of living green, most refreshing to the eye, and impassable. The same proprietor has several other lines of hedge upon his premises, which have been treated in a more rational manner, and which promise much better results—one of those is in a pasture field, and though not in a state for exhibition, may be mentioned as an instance of the great facility of making a fence with this material, even where exposed to cattle from the first. It was planted upon a strip of ground that had been well plowed, and was there allowed to grow, with very little attention or culture for two years; the sturdy plants were then cut off at the ground, and a series of poles was suspended over the row by forked sticks that were driven into the ground among the plants; this furnished a slight guard from the cattle grazing in the field, the ground was then mulched to keep down the growth of grass and weeds—an

occasional clipping in addition to the browsing of the cattle during the last two years, has produced the desired effect; a low broad hedge of thickly intersecting branches; and though the sides are not mathematical planes, the sensations of pleasure which this object excited in me were infinitely greater than could have been aroused by the trim and accurately cut vertical walls of foliage which are sometimes shown as specimen hedges, but which must inevitably suffer at their bases from the want of sunshine, air and rain upon their lower portions; all which is obtained in the most perfect manner by adopting the pyramidal figure with sloping walls, meeting in the apex at the top of the hedge.

Goodfellow's Premium. In the beautiful county of Clark, the Agricultural Society has most judiciously included hedges in their premium list, and as the first award had been rendered to a piece of eighty rods grown by Mr. Goodfellow, I anxiously visited the hedge. Part of this county, containing a large proportion of prairie and open lands, were early subjected to the inconvenience of deficient timber, and many of the English settlers had made attempts to introduce varieties of thorns for hedging purposes, but they were not successful.

Mr. Goodfellow is a fine specimen of an Americana; native Buckeye, born and bred in the neighborhood where he now resides, without any prejudices for or against the Maclura, he has tried the experiment, and with sufficient success to secure the premium for his hedge, which is indued worthy the proud distinction awarded, although it is not perfect. He agreed with me that he had been induced to hasten its upward growth without sufficient regard to the formation of a broad thick base. A part of this hedge is turned out upon the public road, and is a protection from the cattle; the remainder is about to be similarly exposed; and will form a very pretty feature in the rural landscape. The proprietor told me of the approach of his cows when first turned out from the barnyard, last spring; one of them eagerly approached the hedge to have a good scratch and frolic, as is their wont; she bowed her head, and thrusting her horns into the Maclura thicket, was prepared to tear it in pieces, when, lo! instead of the usual toss and bellow, she most quietly and prudently stepped back from the thorny embrace, and the whole herd have since refrained from any salutation of the kind when passing the hedge. I had only to suggest that a more sloping side should be adopted in the further trimming of this hedge. The same suggestion was proposed in the treatment of another hedge nearer Springfield, planted by Mr. Bean around his garden. Indeed, at Kelly's Island and almost everywhere, where hedges are not entirely neglected, after planting, this mistake is prevalent. Though a neat square vertical wall of living green may be a very beautiful object, it cannot be too severely reprobated, because it is not consonant with correct principles, and must lead to disappointment.

Spring-Grove and Others. It will be expected that something should be said about the live fences in our own neighborhood, since some of them are among the oldest in the State, and frequent reference has been made to them by other writers—would that I could speak more flatteringly thereof. Of Mr. Outcalt's, formerly my own, I may now be allowed to speak with greater freedom than heretofore. It was one of the first that was planted widely, in a single row, the plants being from fifteen to eighteen inches apart. Mr. O. has taken a just pride in its appearance, and with good trimming has made it an object of just pride, and it is now much better deserving of encomium than when, at two years of age, it was presented to the State Board of Agriculture, in 1850, for the inspection of a committee who declared themselves perfectly satisfied with the result. Mr. McAvoy's hedge, at the Garden of Eden, which was also exhibited to the same committee, has been turned out to the commons, adjoining the city, for two years, and constitutes a fence against cattle and biped marauders.

Spring Grove. All visitors to our beautiful cemetery must have paused to admire the neat inclosures of Maclura that

surround this peaceful city of the dead. Though subject to criticism now, as heretofore, its beautiful, bright green leafery cannot fail to attract all observers, whether quietly pursuing their devious way among the silent tombs, or hurried with locomotive speed along the railway that traverses these grounds; for the directors have inclosed the road with a hedge on either side. I have said these are subject to criticism—it is to the effect already mentioned, a sacrifice of breadth to hight—too much haste to get up in the world, or, as was observed by a visitor, when looking at the portion by the railway, "that hedge should be laid upon its side," for it is one foot wide by two feet high. This portion, however, is cultivated and trimmed upon much better principles than the outside hedge which was described and criticised in a former number of this work, on account of the wattling or interlacing of the shoots at the end of the second year's growth, and the introduction of stakes and strips nailed to them to stiffen the basket work, whereas, all the shoots should be cut off within four inches of the ground. Though now a beautiful object, and by judicious trimming encouraged to spread its lateral branches, and altogether a credit to the persevering manager of this department of our favorite cemetery, the hedge is not staunch, but may be shaken for rods by the hand; and a drove of bullocks would be apt to make sad havoc with it if frightened into a stampede; moreover, there are many places where the lower branches have not become thick enough to form even a leafy screen, and insidious pigs would find an easy access at some points were the outer fence removed.

It is a matter of regret that the energetic manager of this department of our cemetery can no longer point with pride to the beautiful screen of buckhorn and Maclura which formerly shielded his Spring Garden from the dusty turnpike. This highway has been enlarged at the expense of his grounds and the hedge has been destroyed.

Harbeson's and Burnet's. Beyond the Farmers' College, on the road to Mount Healthy, are two specimens of very fair hedging, the first of which has been a good inclosure to the garden of Mr. Charles Harbeson, for about two years, without other fence, though upon the public turnpike road, this hedge is also interesting from the fact that it was partly grown from seed that matured in our own State, upon trees planted by the venerable Major Gano, still standing and bearing fruit within the city.

Wm. Robb and Wm. Neff. On the Harrison Road, a mile beyond the village of Cheviot, the traveler is delighted to observe a beautiful inclosure belonging to Mr. Wm. Robb. That fronting upon the road is supported by a substantial low stone wall upon which the branches rest and from which the hedge rises gracefully with its brilliant green. The wall is a very appropriate foundation to the hedge, and it is, perhaps, scarcely fair to state that it fills a gap bare of branches, from the earlier bad treatment of the hedge—the prevailing error. The avenue of approach to the beautiful mansion of Mr. R. is guarded by a double row of Maclura that must make a fine shelter in winter, with the aid of the evergreens that shade the drive, the hedge is also a fence against cattle. Other portions of the inclosures, especially that about the vineyard, are in good keeping, and have been carefully and judiciously tended by the proprietor, who is justly proud of this permanent improvement, left him by the former owner, Mr. Wm. Neff, who was one of the first to introduce this sort of fencing to the notice of our farmers. These hedges must now be fifteen years old, and present as healthy an appearance as any that are in the State, although the stems are so old as to be enveloped with moss.

McGrew's. After many months of anticipation, I have at length been able to visit the hedges of Mr. James McGrew, at Alexandersville, near Dayton, Ohio. This gentleman has become well known in our State as a warm advocate of the Maclura; indeed he is so from interest as well as from conviction, the result of experiment. At the last December meeting of our State Board of Agriculture, at Columbus, he was obliged almost alone to battle the wall in

its defence, against fearful odds of grey heads and dignitaries of the body; some of whom confessed that they had never seen a properly managed experiment. The honest, straight forward account given by Mr. McGrew induced the sagacious editor of the Ohio Farmer to call upon him for a communication, which elicited the best paper we have had upon the subject of hedging; indeed, it should be incorporated in the Agricultural Report of the State. Mr. McGrew is so earnest in his devotion to hedging, that he has rented his farm and devotes himself almost exclusively to the business; not only has he induced his once unbelieving neighbors to plant miles of hedge, but he and his associates have large contracts amounting to hundreds of miles. The Central Railroad of Illinois alone have contracted for one hundred miles of hedge on either side of their highway through the prairies.

Passing through the rich bottoms of the Great Miami, where everything, even the corn, is wont to look up, I approached Maple Grove Farm, with some misgivings, it must be confessed, for I have been so often disappointed in hedges, that I expected nothing else than, like most others, this, too, would be open at the bottom. How great and how agreeable was the disappointment when I beheld a *mass* of green leaves and twigs; no longer a wall of perpendicular green, with a broad, flat top, growing wider to shade and destroy the more useful branches below, but a mass, impenetrable to booted foot, or pig or rabbit, and of such just proportions as to extract exclamations of admiration; six feet at the base by three feet in hight! Here, now, at last, is a perfect fence of beautiful green! *Eureka!* was the exclamation—here, indeed, is a premium hedge—no need of stone wall, nor a "base-board," which some one has said, and with great reason, too, in many cases, would be necessary to perfect the fence—no base-board could be inserted here as to a wire fence, nor is any needed. A single row of plants, set upon ground well prepared, and kept well cultivated, the plants cut off close to the ground at one year from the planting, and repeatedly cut back, at the end of two more summers will have covered the ground for two or three feet wide, and will be one foot to eighteen inches high, and after that will effectually smother the grass and weeds, and prevent all ingress or egress except to such animals as can jump high and wide at the same time; but with four seasons' growth and trimming, will make, what any person may see at *Maple Grove*, a perfect fence of the most beautiful character, with noble corn on one hand and a herd of farm stock grazing within ten feet upon the other side.

There are, no doubt, other hedges that should have received a notice, but my limited opportunities of observation have not enabled me to study them. Mr. Bateham, at Columbus, has a fence, upon the street; and in Preble county, as also in Wayne county, Indiana, there are excellent hedges of Maclura and also of the English thorn; but enough has been said for the present.

J. A. W.

Crust of the Earth.

The crust of the earth, thinner *comparatively*, there is reason to believe, than the shell of an egg, though certainly many miles in thickness, is solid rock, covered three-fourths, as before stated, with water, and the remaining fourth, with broken rocks, stones, rounded pebbles, gravel, sand and clay, to a depth of from a few inches to a few hundred feet; the whole sustaining an atmosphere supposed to be about 45 miles in height, and known to weigh just about 15 pounds to each square inch of the earth's surface. The weight of air over each square foot of the earth's surface is 2160 pounds; and the weight of the whole atmosphere is equal to the weight of a covering of water over the entire globe 34 feet deep. This is known from the action of a common suction pump, in which the pressure of the atmosphere just balances a column of water 34 feet high.

In purchasing a farm we should not look at it *merely* as it *is*, but as it *may be*. We should study its *capabilities*, see *how* they can be developed, and count the *cost*, and the probable return.

Influence of Light upon Vegetation.—No 4.

CAMELIA.

Our next proposal is to inquire generally into the degree of light necessary to cultivate the numerous species and varieties of *Camelia*, in the artificial structures of this country, so as to flower them in the highest possible degree of excellence, as well as to maintain the plants in a healthy and luxuriant condition. As we were before called upon when speaking of heaths, so are we again now, strongly to condemn the practice of growing a mixed collection of plants in one house, as the ill effects of which it is productive, are perhaps more fully exemplified in Camelias, than in almost any other extensive tribe of plants. In nearly every collection of plants in which Camelias are cultivated, except when they are allowed a house to themselves, they are kept in the green house or conservatory, and exposed to all the light which can be admitted by a glazed roof, and what is still worse, are frequently placed in the open air, during the summer months, beneath the full blaze of a meridian sun. In such cases it is not surprising that they never attain that luxuriance of foliage which is one of their chief ornaments, and that their flowers are always of an inferior character. It would indeed be matter for wonder, if these effects did not become manifest, as it is well known that Camelias delight in a shaded position, and one in which they are naturally, or can be artificially, screened and protected from the more violent rays of the sun. Since then it is a fact sufficiently and incontestibly proved and established, that Camelias do not require a great degree of light, and indeed, that the degree of light to which the usual inhabitants of our green-houses are exposed, is prejudicial and injurious to these plants, how is it possible that any success can attend the system of management wherein their habits are not consulted, but the treatment pursued towards them is literally pernicious and detrimental? If an individual were to advise any gardener or cultivator to allow his green-house or stove plants to remain exposed to the inclemency of the weather during a night of severe frost, he would instantly scout such a proposition with deserved ridicule and scorn. And yet strange to say, that very gardener or cultivator is continually practising certain systems in the management of various kinds of plants, which are as decidedly injurious to those plants as frost would be, although not to the same extent!

It is somewhat extraordinary, that a perseverance in indiscriminate treatment should render it necessary so strenuously to decry a system, which is admitted by all intelligent cultivators, to be injurious and absurd; but this is a task which horticultural writers continually have to encounter, and certainly it argues very unfavorably for the docility and shrewdness of our practical brethren. The cause of this, however, is two-fold; in the first place, plant cultivators study too much their own convenience, frequently to the prejudice of the plants beneath their care; and secondly, it appears to be a prevailing (but certainly a most erroneous) notion among them, particularly with those who possess green-houses of limited size, that the greater variety of plants they can collect together, the more pleasing and ornamental will be the effect produced. By cultivators studying too much their own convenience we mean, that they will seldom take the trouble to adapt their treatment to the habits of each particular plant, and in fact, by cultivating a miscellaneous assemblage of plants of the most incongruous habits in one house, it is absolutely impossible to give to each the particular treatment it requires, however, much the cultivator may be disposed to do so. It therefore follows, that, in a collection of green-house plants, however limited it may be, it is wiser and better to cultivate only such as assimilate to each other in habit, in one house, and thereby to grow them to the highest state of perfection, than to reduce to a general system of treatment, a mixed assemblage of the most contrary kinds, to the great injury of the whole collection, and very

probably to the total destruction of many plants.

That the species of *Camelia* require a house to themselves, and that such a house should be peculiarly situated, we have previously demonstrated; and we now recommend that the Camelia-house should have a north-western or western aspect, in which case the plants would never be subjected to a greater degree of light than they are able to endure without injury. There are, however, many plants of similar habits, for which such a situation would be admirably adapted, and among these, *Rhododendrons* may particularly be mentioned, which of course might be admitted to a place in the Camelia-house. But where a situation so congenial to their habits cannot be secured, it is important that they should be shaded during the summer months; and on no account whatever should they be removed to the open air, unless to a very shaded situation, as we have fully experienced the ill effects which such treatment is calculated to produce.

The next description of plants on which we propose offering a few remarks relative to the influence of light, is the highly fashionable and popular genus, *Pelargonium*. It is almost unnecessary here to state, that the beautiful species and varieties of this genus require a great degree of solar light; as every person must have witnessed the bad consequences resulting from the confinement of these plants in a sitting-room, or other situation, where light can be only partially admitted. It is not uncommon for amateurs and even gardeners to ascribe such effects to the want of air, but it is sufficiently evident that solar light is the most essential agent in the production of strong and healthy shoots, and also of large and handsome flowers; and that where there is any deficiency in the supply of this element, there will be a corresponding defect in the health and beauty of both plants and flowers.

Under the head of Miscellaneous Green-house Plants, we intend classing the genera *Acacia*, *Banksia*, *Protæa*, *Fuchsia*, and in short all those green-house plants which possess no affinity in character or habit, to either of the four divisions previously considered. Most of the plants of this class thrive best in a house where an abundance of light is supplied, and may, therefore, without impropriety be congregated together in a distinct house, and kept as near as possible to the glass. We may here be permitted to explain what we intend, when we recommend allowing any plants a great degree of solar light, and also to enumerate the means of effecting that object; and first we would recommend that the aspect of the house, should be as nearly as possible facing the south, or between this point and south-west: secondly, that the materials of which the roof of that house is constructed, should be of the slightest procurable description, consistent with strength, so as to offer as little obstruction as possible to the sun's ray's; and where expense is not so much regarded, curvilinear roofs will be found far superior to those of the usual construction: thirdly, it is of great importance that the plants should receive the rays of light vertically, and not obliquely; that is, that they should all be placed so as to receive the light from the roof in preference to the sides or front of the house; it may here also be observed, that the roof of the house should be so inclined according to the sun's average declination, that there be the least possible refraction of light; lastly, that the plants should stand at a sufficient distance from each other, to admit of the access of light on all sides, and also be so arranged according to their sizes, that the smaller plants shall not be shaded by the larger ones. With reference to this latter particular, however, where the plants are placed in the bed or border of the green-house or conservatory, it should be borne in mind at the time of planting them, that there may be a great diversity of age in the plants, and thus, those which are at that time the smallest, may ultimately become the largest; so that they should not be planted according to their actual height, but according to that which they may reasonably be expected to attain, otherwise it will be found that those of more rapid growth will eventually deprive the others

of the beneficial influences of the sun, and thus materially injure them.

To the propriety of separating a collection of green-house plants into these five divisions, we are aware that some objections will be entertained, since there are few cultivators who possess sufficient means for building five distinct houses for plants of this description; and the taste for variety is so prevalent, that, as we have before remarked, a whole collection of plants is frequently sacrificed, merely because the cultivator is desirous of possessing as many different kinds as he can possibly collect. It were easy to show, that a most pleasing variety might be obtained from plants of the same habits, and that all that can be called variety in the most extensive mixed collections, consists only in the difference of habit and structure, while there is one uniform appearance of sickliness and deterioration, and none of that health and beauty which can alone be pleasing to a refined taste. We have repeatedly witnessed the ill effects of the usual system of mingling plants of varied habits, and we recommend all cultivators with limited means to devote their attention to one particular class of plants, not merely as an excellent author has observed, because every thing around us proves that man is incapable of attaining success if his attention be directed to too many objects at once; but also because a peculiar kind of treatment is necessary for different tribes of plants, and unless they are placed in circumstances where that treatment can properly be administered, they will never arive at the degree of perfection to which they are capable of being brought. In more extensive collections, the object of these remarks may be fully effected, by erecting glass partitions in the green-house, for the purpose of separating the different tribes of plants, where distinct houses cannot be set apart for this purpose; but we must and will contend, that complete success in the cultivation of any of the tribes before named, cannot be attained unless they are allowed a house or a division of a house (which is virtually the same) to themselves, and therein treated according to their particular nature and habits.

Before we dismiss this subject, it may be well to adduce a few observations on the influence of solar light generally upon vegetation, and in these we shall endeavor to embrace all hardy plants.

Solar light is the grand cause of all color in vegetation, both in foliage and flowers and hence an elegant author has most aptly designated the sun the great *limner* of nature. It is the action of solar light upon the leaves of plants which produces their lively green color, and also elaborates the sap, converts it into pulp, imparts to the plant its vital energies, and sustains them in health and vigor. To solar light, all flowers are indebted for their brilliant hues, as those which are produced in the dark are almost entirely destitute of color. In fact, all color in vegetable substances, is but the decomposition and partial reflection of solar light so that no substance has actually any color in itself, but the hue it presents, depends upon its capacity for absorption of light. The sun may be said to be the prime source of color in vegetation, in two ways; first, by qualifying it for and regulating its capacity of the reception of prismatic rays, which is undoubtedly the principal and most essential one; and secondly, by its actual radiation on the substance, eliciting its capacity of absorption, or in other words its color, by rendering it visible, which artificial light is incapable of doing; as is proved by the popular opinion, that daylight alone displays the true colors, while artificial light, itself decomposed and imperfect, is deceptive. Light is also the principal agent in producing the means whereby plants may be increased, as seeds will never mature themselves properly in the absence of a due degree of this element.

From these remarks, the necessity of a constant supply of light to all plants, will be sufficiently obvious; but in the cultivation either in artificial structures or in the open ground, it must be modified and adapted to their particular circumstances and habits. As a general rule, however, we may ob-

serve that where plants are required to produce seed or fruit, they cannot be too much exposed to solar light throughout the whole period of their growth, (some few sorts excepted); and, on the contrary, when flowers alone are desired, they should be shaded as much as practicable after the flowers are expanded, though prior to this, they should be exposed to solar light as much as is consistent with their general habits. Again, most plants that are firmly and fully established in the ground, will endure almost any quantity of light, if they are well supplied with water at its roots; but those which have been newly transplanted, require to be shaded from the fiercest of the sun's rays, otherwise they would be exhausted and killed by excessive evaporation.

Enough, however, has been said to show the great importance of attention to this subject in a practical point of view, and we trust what we have advanced will have the effect of inducing cultivators to investigate this subject more minutely; as we are confident that by thus consulting the habits of plants, and the reciprocal influences subsisting between them and the atmosphere, their systems of cultivation may be meliorated, difficulties which now attend them will be removed, and that which is now in many instances a toilsome and unsatisfactory task may be rendered a delightful amusement.—*Pax. Bot. Mag.*

Process of Germination.

It has been proved by the most accurate experiments, that seeds, during their germination, and up to the time of their first putting forth leaves, absorb oxygen, and emit carbonic acid, the reverse of what takes place subsequently. Now why is this? Probably that the embryo plant may be surrounded with carbon, dissolved in the water of the soil, and may thus obtain through its first roots, that kind of food, carbon, which it is destined subsequently to receive from the air through its leaves. This seems very much like a provision for it, on its way up into the air, not unlike what would happen if a mother, whose son was starting for a long and solitary walk, should slip into his pocket some food for the way. Every one can make his own reflections. To me the fact seems worthy of notice.—NASH.

Solar Heat.—No. 4.

RADIATION.

Plants, it is well known, have a temperature altogether peculiar to themselves. This does not arise so much from the elicitation of latent heat—although, probably, internal chemical combinations may tend to increase it—but is acquired chiefly by the admission of warmer fluids from the soil into the roots, and their tranfusion throughout the entire plant, by the vessels. The power of retaining this temperature depends entirely on the stage of the plant's progress, and the consequent density or porosity of its cuticle. Unless duly preserved by a perfect epidermis, the extent of radiation will be equal to the difference between the temperature of the plant, and that of the atmosphere. This will at once account for the effects of cold on the imperfectly developed, or incompletely matured substance of plants. A knowledge of the laws and process of radiation, is of the greatest value to the cultivator of exotics; as the safety of all the objects under his care, is almost wholly dependent upon the manner in which the reduction of temperature is prevented. Protection of all kinds may be said to consist in effecting this simple object; and so far only as it is conducted with that specific end in view, can it be either suitable or successful.

Radiation, as we have shown, is carried on at the surface of plants, and caused by contact with, or exposure to, a colder atmosphere. If, then, we envelope tender plants in an atmosphere of their own, or obviate the transit of heat to the external air, by interposing some material of slow radiating power, we effectually preserve them from injury by frost. When cold is not very intense, but vegetation extremely susceptible, as, for instance, in the spring and autumnal seasons, at which times the frosts are trifling, and the substance of plants only newly developed, or but partially organized, more especially in the latter case, a covering of any slight material will be sufficient to restrain radiation from proceeding too rapidly, or to too great an ex-

tent. The screen, however, must always be perfectly detached from the plant which it surrounds, otherwise, conduction will be substituted for radiation; a consequence by which the remedy will be nearly nullified.

Attempts to naturalize any exotic plants can only terminate in the desired result, when active attention is bestowed upon the particular just named. The most careful preservation during the winter will be of little avail, unless a similar protection is nightly afforded, in the decline of autumn, and the commencement of spring; at least, when the atmosphere is clear, or there is any indication of frost. It would be difficult to decide at which of these seasons defence is most requisite. Although a slight consideration, would lead us to declare, that the greatest necessity existed in the spring months, because vegetation is then in a highly excited and impressable condition; further investigation establishes an equal need for it in the fall of the year. In the autumn, both the soil and the plants growing on it, are more highly imbued with heat than the atmosphere; and hence, the excessive radiation which takes place during the cool night hours of that season, is, on account of its abruptness and violence, very injurious to the members of the vegetable world. The abstractions of heat from the soil during winter, leave them in a completely inversed condition in the spring; and their average temperature is decidedly below that of the atmosphere in the day, so that they are the less able safely to part with any caloric at night. We conclude, therefore, that shelter is equally essential to tender plants, at both these epochs; but, that a much thinner covering is required in the autumn than in the spring; because vegetation is thoroughly furnished with internal heat, in the former, and retains a small amount only in the latter season.

Inferior only in degree to the radiation, from plants fully exposed to the atmosphere is that of the more delicate kinds, which are confined in houses. Glass has been before declared to be a most liberal radiator of heat; and hence, the greater the amount of glazed surface a house presents the more speedy and perfect will be its radiation. The temperature of a plant house being diminished, that of the plants will rapidly be reduced likewise; and as vegetation is always more or less susceptible according to the circumstances to which it has been habituated, those plants which are kept in an artificial condition will suffer considerably from the most trifling degree of radiation, to which they may be subjected. To retard radiation in hothouses, and prevent it from entailing any injurious consequences on the plants which they protect, recourse is generally had to the introduction of artificial heat. In this respect, cultivators err most egregiously. Radiation is effected from the *external* surface of the house, and the means professedly employed to counteract it are usually arranged near or beneath the *lower* surface. Notwithstanding the lightness and ascension of heated air, the porosity of the glass combined with the numerous fissures which occur at the junction of the panes, invariably maintains the superior stratum of atmosphere at a low temperature. The upper and *most* tender portions of plants, are thus brought in contact with the *coldest* air, and these being rendered more susceptible by the excitation of heat from below, are kept in a perpetual state of conflicting exertion and endurance.

Did plants require to be supplied with a uniformly high temperature throughout the winter season, the practice here denounced would be in some measure defensible. But this is not the case. We hesitate not to affirm, that the total exclusion of frost is all that is desirable with even tropical species. How much more easily, safely and effectually, then, could this be ensured, by an exterior covering to the roof! This appears to us the only rational mode of procedure, seeing that it is through the roof alone that frost can be admitted, or, more strictly speaking, heat dissipated. And, though we grant the utility and propriety of applying fire heat in extreme cases, it should never be regarded otherwise than as an inevitable auxiliary. If it be urged as an objection to the above method, that such a measure would exclude light as well as

frost, the torpidity of the plants under the circumstances recommended, will render the continued action of light unnecessary. Complete dormancy, and partial darkness, are by no means incompatible: nor is the latter, when coincident with the former, at all detrimental. When maturation is duly effected, and circulation has entirely ceased the absence of light is rather to be desired than deprecated. These qualifications must, however, be regarded with the greatest accuracy, and every precaution taken to produce and maintain the state here described. A departure from this would counteract the good effects of the system, endanger the health of the plants, and engender prejudice.

To these observations on radiation, we may be allowed to request more than ordinary notice. The cultivator who is anxious to obtain celebrity, and is yet unacquainted with the principles and influences of this process, is pursuing an uncertain route to a goal which nothing but a rare concatenation of fortuitous circumstances can enable him to reach. But, enlightened on this point, he may continue his progress without a doubt of ultimately obtaining satisfactory and honorable success. It is to this, and principles such as this, that the horticulturist must alone look for advancement in his art; and these, it will ever be our object to elucidate and establish.

Inferences of a practical nature are also deducible from the fact of fluids circulating only when rarified by heat, and of the same agent acting as the prime causative of accretions to the substance of plants. Since heat alone can induce an upward flow of sap, it is clear that the supply must be apportioned to the demand; or, in other words, that heat must accompany moisture in equal proportions. A continued application of water, in a low temperature, would speedily surfeit plants, and either obstruct or rupture their vessels. Injury of a much more serious nature, or at least more immediately perceptible, follows a contrary course of treatment: withering and contraction are soon apparent, and the plant rapidly decays. Healthy developements are the consequences of appropriate excitation; and the only method of ascertaining the degree of temperature required to render them of such a character, is by accurate observation of the habits of the plant. Either too great or too limited a supply of heat, or its employment at an unseasonable period, will produce similar results: sickly, imperfect, degenerate growth. In the practice of acclimation, therefore, the *gradual* adaptation of plants to the climate, or of the climate to plants, should be the first and greatest, indeed, almost the only concern of the cultivator. Connected with the growth of plants, and constituting, in fact, an epoch thereof, is the developement of their blossoms, and the formation and maturation of their fruit and seed. Heat is essential to the due performance of these functions, especially of the latter; and hence it is that many exotic plants seldom, in this country, produce flowers; the temperature being inadequate or not sufficiently uniform and continuous. Various modes of accounting for the infertility of plants have been adopted by different authors, among which, a consideration of the quality of the soil, appears to have obtained a prominent place. There can be no doubt that soil exercises a considerable influence on vegetable production; but it seems to have been forgotten, that, unless possessing peculiar properties, it is not so much the chemical composition as the capacity for the retention and circulation of fluids, which renders it inimical or congenial. The importance of light in promoting fertility, has before been insisted on; this agent is, however, chiefly requisite for the plants of temperate climates, as the majority of tropical species do not luxuriate beneath the immediate beams of the sun, but have shade afforded them either by surrounding vegetation, or the dense vapor of the superincumbent atmosphere.

It is a singular fact, that we speak of a clayey soil as *heavy*, and of a sandy soil as *light*, meaning that the first is *difficult* to work, and the second *easy*. If we speak of them with reference to their *absolute weight*, the reverse is true—clayey soils are *light*, and sandy soils *heavy*.

Sugar.

BY PROF. J. F. W. JOHNSTON.

The numerous varieties of useful sugars with which we are acquainted, may be arranged under four main kinds or heads. These are the grape sugars, the cane sugars, the manna sugars, and milk or animal sugar. I shall treat of each in its order.

I. GRAPE SUGARS.

These include, as varieties, the sugar of the grape, the sugars of honey, the sugar of fruits, and potatoe or starch sugar.

1. GRAPE SUGAR.—When the ripe grape is dried in the air, it forms the well known raisin of commerce. When this raisin is opened, numerous whitish crystalline brittle granules are seen within it, which are sweet to the taste. These consist of what is called grape sugar, and they are the source of the sweetness both of the grape and the raisin. It dissolves readily in water, and if yeast be added to the solution, soon enters into fermentation.

The results of this fermentation are, first, a spirituous liquor resembling weak wine, and afterwards, as the fermentation proceeds, an acid liquor, like sour wine or vinegar.

In Syria, a sweet preparation is made from the juice of the grape. It consists chiefly of grape sugar, and is exported to Egypt under the name of *dips* or *dibs*.

2. HONEY SUGAR.—The bee has been long known and admired for its industry, and the honey it collects, indulged in as a luxury. This honey is formed, or naturally deposited, in the nectaries of flowers, and is extracted from them by the working bees. They deposit it in their crop or honey-bag, which is an expansion of the gullet (œsophagus,) and from this receptacle they disgorge it again when they return to the hive. In the interval, it is probably somewhat altered by admixture with the liquids which are secreted in the mouth and crop of the insect—so that the honey we extract from the hive may not be exactly in the same chemical condition as when it was sucked up from the flowers by the laborious bee.

When liquid honey is allowed to stand for a length of time, it gradually thickens and consolidates. By pressure in a linen bag, it may then be separated into a white solid sugar, consisting of minute crystals, which remain in the bag, and a thick semi-fluid syrup which flows through it. In old honey the proportion of syrup is often small, the sugar of the syrup gradually crystallising in greater quantity. Both the solid and liquid sugars have the same general properties. They are both equally sweet; both have the same chemical composition, and both begin to ferment when water and a little yeast are added to them. The solid sugar of honey is identical with the sugar of the grape. The liquid sugar differs from the solid chiefly in refusing to crystallise, and in containing an admixture of coloring and odoriferous substances produced by the flowers from which the bee has extracted it.

To these foreign substances honey owes the varied colors, flavors, and fragrances, which in different countries and districts it is known to possess, and for which it is often highly prized. Hence the estimation in which the honey of Mount Ida, in Crete, has been always held. Hence also the perfume of the Narbonne honey, of the honey of Chamouni, and of our own high moorland honey when the heather is in bloom. Sometimes these foreign substances possess narcotic or other dangerous qualities; as is the case with the Trebizond honey, which causes headache, vomiting, and even a kind of intoxication in those who eat it. This quality it derives from the flowers of a species of rhododendron (*Azalea* pontica,) from which the honey is partly extracted. It was probably this kind of honey which poisoned the soldiers of Xenophon, as described by him in the retreat of the Ten Thousand.

3. FRUIT SUGAR.—Many of our fruits pass, in the course of ripening, from a sour to a sweet state. The apple, the pear, the plum, the peach, the gooseberry, the currant, the cherry, &c., are of this kind. Most of them, even when fully ripe, are still a little acid; the mixture of sweet and sour in their juices, adding to their agreeable and refreshing qualities. All such fruits, as a general rule, contain, and owe their sweetness to, grape sugar. From many of them this sugar can be readily extracted for use; but, in general, it is more economical and agreeable to employ it in the form of dried and preserved fruits, or to make wine of it, as we do of that which exists in the grape, the gooseberry, the apple and the pear.

4. POTATO OR STARCH SUGAR.—It is a property of starch of all kinds to be insoluble in cold water, but to dissolve readily in boiling water, and to thicken into a jelly or paste as it cools. Even a lengthened boiling in water, however, produces little further change upon it. But if a small quantity of sulphuric acid (oil of vitriol,) be added to the water in which it is boiled, the solution gradually acquires a sweet taste, and ultimately the whole of the starch is converted into grape or honey sugar. A pound of acid diluted with a hundred

pounds of water, and employed in this way, will convert into sugar a great many pounds of potato, wheaten or sago starch. If the acid be then separated by lime, and the liquor boiled down, either a rich syrup or a solid sugar may be obtained. Or, instead of sulphuric acid, we may mix with with the water, 12 or 15 lbs. of malt for every 100 lbs. of starch; heat for three hours to 160 or 170 degrees Fahr., and then filter and evaporate the syrup. Sugar thus prepared from starch has the same sweetness, chemical composition, and general properties as that of the grape. It does not always crystallise readily, however, and in this respect has more resemblance to the liquid sugar of honey than to the solid sugar of the dried grape. It is used for ordinary sweetening purposes, for adulterating cane sugar, and for the manufacture of spirituous liquors. On the continent of Europe it is largely prepared for all these uses. The syrup is extensively employed by the French confectioners, and brandy distilled from it is very generally drunk in northern Europe. The manufacture of starch sugar is illegal in this country, (England.)

Instead of starch, wooden fibre may be employed for the manufacture of this kind of sugar. Paper, raw cotton and flax, cotton and linen rags, and even saw-dust, may be transformed into sugar by digestion in diluted sulphuric acid. The operation is only a little slower, and therefore requires more time. This is partly explained by the fact that the acid first changes the fibre into starch, and then the starch further into sugar.

It is known that many sea-weeds, when boiled in water, yield a syrup which is wholesome, nutritious, and more or less agreeable to the palate. Among these are the well known Carrigeen moss (*Chondrus crispus* and *mamillosus*) which is collected in large quantities on the west coast of Ireland, and the Ceylon moss (*Plocaria Candida*,) which is exported from the islands of the Indian Archipelago to the markets of China. The jelly yielded by these sea-weeds, as well as by the Iceland and other land mosses, is in like manner converted into grape sugar, when digested with diluted sulphuric acid.

The number of vegetable substances, therefore which by means of this acid can be transformed into the sugar of honey and fruits, is very great. Starch, however, is the only one to which the process has hitherto been applied with a profit.

5. Elderberry Sugar.—In the berries of the elder tree (*Sorbus aucuparia*,) a peculiar species of sugar has recently been discovered, to which M. Pelouze has given the name of *sorbine*. In the degree of sweetness it possesses, and in chemical composition, it agrees with grape sugar; but it differs from it in its other properties, and in its crystalline form. As yet, however, this variety or sugar, is of no economical value.

II. CANE SUGARS.

The plants or fruits which possess distinctly acids of sour juices, yield grape sugar. Those which have little acid in their saps, contain for the most part cane sugar. The chemical reason for this is, that, by the action of acid substances, cane sugar is gradually transformed into grape sugar, even in the interior of the growing plant. The principal varieties of cane sugar known in commerce, are the cane sugar properly so called, beet sugar, palm or date sugar, maple sugar, and maize sugar.

1. Sugar Cane or Chinese Sugar.—The sugar cane is the chief source of the sugar of commerce. About eleven-twelfths of all the sugar extracted for use is obtained from this plant. Though almost unknown to the Greeks and Romans, and now cultivated most extensively in America, it is a native of the Old World. It was familiar in the East in most remote times, and appears to have been cultivated in China and the South Sea Islands long before the period of authentic history. Through Sicily and Spain it reached the Canary Islands, thence was transplanted to St. Domingo by the Spaniards in 1520, and from this island it was gradually spread over the West Indies and the tropical regions of the American continent. It flourishes best where the mean temperature is from 75 to 77 deg. Fahr.; but it thrives, and can be economically cultivated where the mean temperature does not exceed 66 to 68 deg. Fahr. Hence it is grown far beyond the tropics. And although the countries most productive in sugar, and which yield it at the least cost, lie for the most part within the torrid zone, and at low elevations,—yet the sugar cane is profitably grown in some parts of the south of Europe; on the table-land of Nepaul, in India, at a heighth of 4500 feet and on the plains of Mexico, as high as 4,000 to 6,000 feet above the level of the sea. It rarely ripens its seed, however, even in the most propitious localities. Young plants are raised, therefore, from portions of the stem planted for the purpose; and when cultivated for sugar, they are rarely allowed to come to flower.

There are many varieties of the sugar cane, as there are of nearly all long-cultivated plants. In general, the varieties most common in each country and district are

best adapted to the local climate and to the soils in which they grow. Those which yield the sweetest juice, and in the greatest abundance, if otherwise suited to the climate, are the most esteemed. In Louisiana, five different varieties are cultivated. In each locality that variety is selected by the planter, which he finds to give, on the whole, the most sure and profitable crop. And so in our West India colonies the Tahati cane was introduced as a new variety, because in the same time, and from the same extent of land, it yielded one fourth more juice than the common varieties, while it produced also a larger and more solid growth of wood to be used as fuel.

In Europe and most northern countries, cane sugar is only an article of luxury, though one with which many would now find it difficult to dispense. In many tropical regions, however, the sugar cane forms a staple part of the ordinary food. The ripe stock of the plant is chewed and sucked after being made soft by boring it, and almost incredible quantities are consumed in this way. Large ship-loads of raw sugar cane, are daily brought to the markets of Manilla and Rio Janeiro ; and it is plentiful in the market of New Orleans. In the Sandwich and many other islands of the Pacific, every child has a piece of sugar cane in its hand ; while in our own sugar colonies the negroes become fat in crop time on the abundant juice of the ripening cane. This mode of using the cane, is, no doubt, the most ancient of all, and was well known to the Roman writers.

This nutritive property of the raw juice of the sugar cane arises from the circumstance that it contains, besides the sugar to which its sweetness is owing, a considerable proportion of gluten, as well as of those necessary mineral substances which are present in all our staple forms of vegetable food. It is thus itself a true food, capable of sustaining animal life and strength without the addition of other forms of nourishment. This is not the case with the sugar of commerce, which, though it in a certain sense helps to nourish us, is unable of itself to sustain animal life.

The juice of the sugar cane varies in composition and richness with the variety of cane, the nature of the soil, the mode of cultivation, and the dryness of the season. Its average composition in sugar plantations, when the canes are fully ripe, is about—

Sugar,	18 to 22
Water and gluten	71
Woody fibre	10
Saline matter	1
	100

The richness in sugar varies with many circumstances, and especially with what is called the ripeness of the cane. For it is a curious circumstance in the chemical history of this plant that the sap sweetens only to a certain distance up the stem ; the upper somewhat green part, which is still growing, yielding abundance of sap, but comparatively little sugar. One reason of this probably is, that as fast as the sugar ascends with the sap, it is converted into woody matter, which is built into the substance of the growing stem and leaves. In consequence of this want of sweetness, the upper part of the cane is cut off, and only the under ripe part employed in the manufacture of sugar. In Louisiana, where the canes rarely ripen so completely as in the West Indies, the proportion of sugar contained in the juice is set down as low as 12 to 14 per cent.

For the extraction of the sugar, the canes are cut with a large knife, the laborer proceeding between the rows. The leaves and tops are then chopped off and left in the field, while the under ripe part is carried to the mill. These ripe canes are passed between heavy iron crushing rollers which squeeze out the juice. This juice is run into large vessels, where it is clarified by the addition of lime and other applications. The action of this lime is two-fold. It removes or neutralises the acid which rapidly forms in the fresh juice, and at the same time combines with the gluten of the juice, and carries it to the bottom. The gluten acts as a natural ferment, causing the sugar to run to acid. Its speedy removal, therefore, is essential to the extraction of the sugar. After being clarified in this way, and sometimes filtered, the juice is boiled rapidly down, is then run into wooden vessels to cool and crystallise, and, finally, when crystallised, is put into perforated casks to drain. What remains in these casks is Muscovado or raw sugar ; the drainings are well known by the name of Molasses.

Simple as this process is in description, it is attended with many difficulties in practice. It is difficult to squeeze the whole of the juice out of the cane—it is difficult to clarify the juice with sufficient rapidity to prevent it from fermenting, and so completely as to render skimming unnecessary during the boiling—it is difficult to boil it down rapidly without burning or blackening, and thus producing much uncrystallisable molasses—and it is difficult afterwards to collect and profitably employ the whole of the molasses thus produced. The difficulties, though none of them insurmountable, have hitherto proved so formidable in practice, that, of the 18 per cent. of sugar

contained in the average cane juice of our West India Islands, not more than 6 per cent., or one-third of the whole, is usually sent to market in the state of crystallised sugar! The great loss which thus appears to take place is thus accounted for—

First—Of the 90 per cent. of the sweet juice which the cane contains, only 50 to 60 per cent, are usually expressed. Thus one-third of the sugar is left in the megass, or squeezed cane, which is used for fuel—(KERR.)

Second.—Of the sugar in the juice, one-fifth or more is lost by imperfect clarifying, and in the skimmings removed during the boiling—(SHIER.)

Third,—Then of the juice when boiled down to the crystallising point and set to cool, only from one-half to two-thirds crystallises: the rest drains off as molasses. Thus of the whole sugar of the ripe cane—

One-third is left in the megass	6	per cent.
One-third of the remain'r in the skim'gs	3½	"
One third to one-half of the second remainder in the molasses.............	3	"
In the Muscovado sent to market there are.....................................	5½	"
	18	

The molasses and skimmings are fermented and distilled for rum. But even of the molasses much is lost, the drainage from the raw sugar of the West Indies, while at sea, is stated to be 15 per cent., and afterwards in the docks, at 2 per cent. And further, the leakage of the molasses itself, which is shipped as such, is 20 per cent.; so that of the uncrystallisable part of the sugar, also, there is a large waste. In the interior of Java, where fuel is scarce, the molasses is worthless, and is sent down the river in large quantities; but in the West Indies it has everywhere a market value, and may be distilled with a profit.

The cane sugars are popularly distinguished from the grape sugars by greater sweetness or sweetening power. This is said to be greater in the proportion of five to three. They also dissolve more readily in water. One pound of cold water dissolves 3 pounds of cane, but only one pound of grape sugar. The solution is also thicker and more syrupy, less liable to change or run to acid, crystallises more readily, and gives a harder candy. These superior economical properties sufficiently account for the preference so universally given to this species of vegetable sweet.

Chemically the cane differs from the grape sugars, in containing less of the elements of water, in being charred or blackened by strong sulphuric acid, (oil of vitriol,) and in not readily throwing down the red oxide of copper from solutions of blue vitriol (sulphate of copper.) By the action of diluted acids cane sugar is converted into grape sugar, and hence the reason why, as I have already said, cane sugar is rarely found in plants which have acid juices, and why the souring of the cane juice changes a portion of the crystallisable sugar into uncrystallisable syrup or molasses.

2. BEET ROOT OR EUROPEAN SUGAR.—The root of the beet, and especially of the variety called the sugar-beet, contains often as much as a tenth part of its weight of sugar. By squeezing out the juice, as in the case of the sugar cane, or by dissolving out the sugar from the sliced root and boiling down the solution, the raw sugar is obtained. In this state the sugar possesses a peculiar, unpleasant flavor, derived from the beet-root; but when refined, it is scarcely distinguishable in any respect from that of the sugar cane.

The manufacture of this sugar is one of great and growing importance, especially in France, Belgium, Germany and Russia. Its history also illustrates in a very striking way how chemical skill may overcome, as it were, the perversities of climate, and establish upon an artificial basis, an important national interest, which shall successfully compete in the markets of the world with the most favored natural productions of the choicest regions of the globe.

The extraction of sugar from the beet has lately been attempted in Ireland, and, as I am informed, with some measure of success. Little is publicly known, however, of the proceedings of the company by which the attempt has been made.

The average composition of the root of the sugar beet of France, Belgium and the Rhenish provinces, is nearly as follows:

Sugar..	10½
Gluten,..	3
Fibre, &c,...	5
Water..	81½
	100

But this proportion of sugar varies very much. Thus it is greater,—

a In small beets than in large.

b In some varieties, as in the white Schleswick pear-shaped beet, and in a spindle-shaped, red-skinned, white-fleshed variety, both much cultivated in Germany.

c In dry climates, and especially where the climate is dry after the roots have begun to swell.

d In light potato or barley grounds than heavy soils.

e In the part under than above ground.

f When manure has not been directly applied to the crop.

These facts show how much practical agriculture has to do with the success of this important manufacture. The difference of climate, soil and mode of culture, have so much effect, that, while the beets of Lille, a southern centre of the manufacture, do not average more than 10 to 12 per cent. of sugar, those of Magdeburg, a more northern centre, contain from 12 to 14 per cent. Under certain very favorable conditions, as much as 18 per cent. of sugar has been found in the beet of North Germany. The proportion of sugar is so much less in the part that grows above ground, that it is not unfrequently cut off and fed to cattle. This reminds us of the want of sweetness in the upper part of the sugar cane, and the reason is probably the same in both cases, that the sugar is in these parts transformed into woody matter.

The average proportion of sugar extracted in Belgium and France, is 6 lbs. from every hundred of fresh root. In some well-conducted manufactories, it is said to reach 7, and even 7 1-2 lb. from the hundred. In Germany, the average yield is at present 7 or more; and improvements now on trial are expected to raise it to 8 lb. from the hundred.

The mode of extraction is very simple. In France and Belgium the root is ground to a pulp between saw-toothed rollers, a small stream of water trickling over the teeth to keep them clean. This pulp is put into bags, and submitted to strong pressure, by which the juice is squeezed out, while the solid matter remains in the form of a dry cake. This juice is treated with lime, heated, filtered, boiled down by steam to the crystallising point, and then, as in the case of cane sugar, cooled and drained from the molasses. From the beet, the molasses thus obtained is colorless, but it has a disagreeable taste, and cannot, therefore, like cane molasses, be directly employed for any sweetening purpose. The raw sugar has also an unpleasant taste, and is in consequence refined, for the most part, before it is brought to market.

In Germany, it is more usual to slice the beet, and to wash out the sugar with hot water, treating the solution afterwards as above described. The happy discovery of Melsens, of Brussels, that sulphurous acid* has the property of arresting fermentation in sweet juices, has been of much service in making this German method of extraction available.

* Sulphurous acid is the name given by chemists to the strong smelling fumes given off by burning sulphur. In one proportion it forms with lime *sulphite of lime*; in twice this proportion it forms *bi*-sulphite (*bis* twice.) This bisulphite is soluble in water, and a little of the solution added to the weak sugary liquors prevents them from fermenting.

It is interesting to remark how new improvements in this manufacture constantly make known new chemical difficulties, and present new chemical and agricultural problems to be solved. The first great difficulty was, to prevent the fermentation of the juice, the production of acid, and the simultaneous waste of sugar and conversion of a part of it into uncrystallisable syrup. The second was, to boil it down so as to prevent burning, and the production of uncrystallisable molasses. The former has been overcome by various chemical means, and the latter by the use of steam. But as the yield of sugar approached to 7 per cent., it was found that certain syrups remained behind, which, though they certainly contained cane sugar, refused stubbornly to crystallise; and the reason of this was traced to the presence of saline matter, chiefly common salt, in the sap. This salt forms a compound with the sugar, and prevents it from crystallising. And so powerful is this influence, that 1 per cent. of salt in the sap will render 3 per cent. of the sugar uncrystallisable. To overcome this difficulty new chemical inquiries were necessary. As results of these inquiries, it was ascertained—

First, That the proportion of sugar was larger, and of salt less, in beets not weighing more than five pounds. The first practical step, therefore, was, that the sugar manufacturers announced to the cultivators who raised the beet that in future they would give a less price for roots weighing more than five pounds.

Next, That a crop raised by means of the direct application of manure, contained more salt, and gave more uncrystallisable syrup, than when raised without direct manuring. A larger price, therefore, was offered for roots grown upon land which had been manured during the previous winter; a higher still for such as were raised after a manured crop of corn, and a still higher when, after the manuring, two crops of corn were taken before the beet was sown.

Thus, the difficulty was lessened by chemico-agricultural means, and though the crop was less in weight to the farmer, the higher price he obtained in some degree made up the difference.

3. Palm or Date Sugar, or Jaggery.—Most trees of the palm tribe, when their top-shoot, or spadix as it is called, is wounded, yield a copious supply of sweet juice. When boiled down this juice gives a brownish raw sugar, known in India by the name of jaggery. The date palm (*Phœnix dactylifera*,) affords this juice and sugar. The gommuti palm (*Saguerus saccharifer*,) is

still more productive, and, in the Moluccas and Phillippines, yields much sugar. The sap of the cocoa-nut tree is boiled down in the South Sea Islands till it has the consistence of a brown syrup, resembling very much the molasses which drains from raw cane sugar; but the wild date-palm (*Phœnix sylvestris*,) is the largest known sugar-producer. From this tree it is said that 60,000 tons, or 130 million lbs. are yearly extracted. Of this quantity, 5,000 tons, or 11 million pounds are extracted in Bengal alone. Indeed, the chief production as well as consumption of this date sugar is in India. A small proportion of it is imported into this country, sometimes under its true name of jaggery, but often, also, under that of cane sugar.

This palm sugar, indeed, from whichever of the trees it is extracted, is exactly the same species of sugar as is yielded by the sugar cane. It differs chiefly in the flavor of the molasses which drains from and colors the raw sugar. When refined, it cannot be distinguished from refined West India sugar. The flavor of the molasses is not unpleasant, so that it is readily eaten by the natives of the various tropical regions in which the palm-tree grows.

The total known produce of palm sugar is estimated at 220 million pounds. This is about one twenty-fourth part of all the cane sugar extracted for useful purposes.

Other non-acid fruits, like the melon, the chestnut, and the cocoa-nut, contain cane sugar, but it is not extracted from them as an article of commerce.

4. Maple or North American Sugar.—The sugar maple grows abundantly in the northern parts of New England, along the lakes and in the British provinces, of North America. The four States of New Hampshire, Vermont, New York, and Michigan, produce together upwards of 20 million pounds of maple sugar. The settlers generally, when they clear their virgin farms, reserve a few trees to make sugar for the use of their families; but, in many places, extensive natural forests of maple trees still cover fertile tracts of uncultivated country, and there the sugar is manufactured in large quantities. The average yield of each tree is estimated in Lower Canada at 1 lb a head; and the right of making the sugar is there rented out by the proprietor at one-fifth of the supposed produce, or one pound of sugar for every five trees. When the month of March arrives, the sugar-makers start for the forest, carrying with them a large pot, a few buckets and other utensils, their axes, and a supply of food. They erect a shanty where the maple trees are most numerous, make incisions into as many as they can visit twice a-day for the purpose of collecting the sap, boil down this sap to the crystallising point, and pour it into oblong brick-shaped moulds, in which it solidifies. In this way, in the valley of the Chaudiere, from 3,000 to 5,000 pounds of sugar are sometimes made during the season of two months by a single party of two or three men.

It is a singular circumstance in the chemical history of the sap of this tree, that the first which flows for some time after the incision is made, is clear, colorless, and without taste. After standing a day or two this sap becomes sweet; and a few days after the sap has begun to run, it flows sweet from the tree. The last sap which the tree yields is thick, and makes an inferior sugar. When boiled carefully in earthenware, or glazed pots, the clear sap gives at once a beautifully white sugar, and especially if it be drained in moulds and clayed, as is done with common loaf-sugar. In this pure, white condition it is not to be distinguished from refined cane sugar. It is identical with pure cane sugar in all its properties.

For domestic use it is generally preferred of a brown, and by many of a dark-brown color, because of the rich maple flavor it possesses. This flavor, though peculiar, and therefore new to a stranger in North America, soon becomes very much relished. The brown sugar is an article of regular diet among the Lower Canadians. On fast days, bread and maple sugar, or maple honey, as the molasses of this sugar is called, are eaten in preference to fish. In spring, when plentiful, it sells as low as 3d. a pound; in winter it rises sometimes as high as 6d.*

It is an interesting character of the maple juice, when boiled to the crystallising point, that the molasses which drains from it is agreeable to the taste, and is relished as a domestic luxury. In this respect it is superior even to the molasses of the sugar cane. Were beet root molasses eatable in a similar way, the manufacture of beet sugar would have fewer difficulties to overcome; and it would have been now both easier to conduct, and more profitable in its results.

The total production of maple sugar has been estimated at 45 millions of pounds, or the one hundred and twenty-fifth part (1-125) of the whole quantity of cane sugar extracted for the use of man. The manufacture of maple sugar diminishes yearly in proportion as the native American forests are cut down.

5. Maize or Mexican Sugar.—The

* See the author's *Notes on North America*, vol. 1, page 202.

green stalks of maize or Indian corn contains a sweet juice, which, when boiled down, yields an agreeable variety of cane sugar. This sugar was known and extracted by the ancient Mexicans, and was in use among them prior to the Spanish invasion. For this reason I have distinguished it as Mexican sugar.

The manufacture of this sugar has been attempted of late years in the United States, and many persons have successfully extracted a sufficiency for their domestic consumption. It has not hitherto, however been prepared in such quantity, or at such a price, as publicly to compete in the market with sugar from the cane; but there seems no reason why this branch of industry should not be successfully prosecuted, especially in those States of the North American Union which are known to be more eminently favorable to the growth of maize.

The extraction of sugar from this plant has also been attempted in southern Europe. The only existing manufactory of it with which I am acquainted is in the south of France, in the neighborhood of Toulouse. It produces only about 20,000 lbs. of sugar a year. But that this small manufactory can be profitably conducted in a climate less favorable to maize, affords a strong presumption that, in the United States, the cultivation of the plant for its sugar may yet become an important branch of rural economy.

6. SORGHUM SUGAR.—In China, under the name of "sugar cane of the north," a species of sorghum is cultivated for the extraction of sugar. This plant is allied to the *Sorghum vulgare*, or dhurra plant, of which a description has already been given. This plant has recently been introduced into France, and experiments have been made upon it by Mons. Vilmorin. He states that it is capable of yielding, on an average, from an acre of land, 26,000 lb. of juice, containing from 10 to 13 per cent. of sugar; and that this is more than the average yield of the sugar beet. It is alleged, however, that the plant is adapted to only a few parts of the south of France. More will no doubt be heard of this plant, should further experiments confirm the favorable opinions already formed of it.

The total quantities of cane sugar of various kinds, which are extracted for human use, have been estimated by Dr. Stolle:—

	Millions of pounds.	Percentage of the whole producti'n.
Cane sugar........	4587	87.7
Beet sugar.........	382	7.3
Palm sugar.........	220	4.2
Maple sugar.......	45	0.8
	5154	100

Wide differences exist among the quantities consumed per head in different countries—I instance only a few examples. Thus, the yearly consumption is, in

Russia....................	1⅓ lb.	per head.
Belgium	5	"
France,...................	7½	"
United Kingdom.........	28	"
Venezuela	180!	"

With the peculiar circumstances which occasion so large a consumption in Venezuela I am unacquainted. Refined sugar is shipped to that country largely from Europe.

Before leaving this part of my subject, I may be permitted in the interest of chemical science, to ask my reader to reflect—

1. How important an interest, economical and social, the history of sugar extraction exhibits to us as depending directly upon chemical research and progress, and upon the diffusion and application of chemical knowledge.

2. How largely successive applications of this branch of knowledge have already benefited the manufacture of sugar, and aided in bringing this luxury within the reach of the poorer classes; and how much more benefit they promise still to confer.

Farmers' Clubs.

Of these, there should be one in every town,—every village—every neighborhood; alive and at work throughout the year; drilling and instructing its members against the day of annual parade.

The value of a club is not generally appreciated, or no town would long consent to be deprived of its influence. In the first place, at these conversational meetings, held once a week or twice a month, members become accustomed to speak in public, and to express their views with ease. Most men, without practice, are frightened at the sound of their own voices. When they rise upon their feet to address an audience, the thoughts that fill their minds desert them. Almost every speaker will confess to a like experience. But, by degrees, one acquires a self-confidence, which enables him to feel as much at home on the floor and before an audience, as when seated in his own chimney corner, detailing the events of the day to the good wife and children.

In the next place, these occasional meetings strengthen neighborly feeling. Farmers live an entirely too secluded life; they visit little among each other, and seldom stray far from home, except to the store for groceries, or to the town-house to vote. Consequently they lose much of that enjoyment which society affords, and unsocial (not misanthropic) habits grow upon them.

To go out to spend an evening with a neighbor is a matter for a month's discussion. News travel slowly through an agricultural district: so does information. Farmers get behind the times. Now, for all these evils the Club offers a radical cure.

Thirdly, no American farmer can attend the meeting of a Club of his fellows, without receiving instruction. There is no one so well posted up in all that pertains to his profession, that his neighbors cannot enlighten him on some points, by the narration of their successes, or their failures;—for a failure conveys as good a lesson as the most complete success. Failures warn us from following example, as successes incite us to imitation. Then, again, one farmer may be an oracle on stock raising, another excels in tillage-crops, a third—(perhaps this third man may be a mechanic or a clergyman, who has joined the Club for the benefit of his garden patch or glebe)—he is wise in horticultural lore. These three Yankees cannot long occupy the same room without a barter of their intellectual commodities. The parson has swapped away a remedy against peach-borers, for an idea about raising carrots; the stock-breeder has given his friends a cure for garget, or taught them how to pop out "warbles;" in return for which he carries home a new wrinkle about orchard-management, or the most economical way of draining his low lands, &c., &c.

Fourthly the Club induces men to study and to observe with nicety, that they may have something to add to the common fund in return for what they have received therefrom. This is human nature,—that is, the human nature of honorable men. We are not more willing that our comrades should teach us without return, than that they should feed or clothe us without pay. Then our pride spurs us on to show that we, too, have a contribution for the common stock, and if it does not happen to be on hand, we bestir ourselves to acquire it.

Fifthly, a few enterprising men thus brought together once a week, or more or less often, to discuss a subject of common interest, will not long be contented with the narration of what they have done: they will cast about for new fields of exploration, or seek to enlarge the bounds of the old. Thus experiments will be suggested and agreed upon for a coming year; or a county fair will be proposed; or the foundation of other good works be firmly laid.

Sixthly, farmers, seeing the results of combined effort will be gradually led to value it, and to employ it in all matters interesting to them as a class. One and the only reason why the farmers of America are without power, is because they have never learned to act in concert. Touch the tariff, and the whole manufacturing interest is in a ferment; meddle with the slavery question, and North and South buzz like bees and hornets; impose upon artizans, and every country swarms with remonstrating mechanics. But the farmers, though numerous, are divided and beaten in detail.

Seventhly, frequent meetings of farmers will have a tendency to wear away prejudices; which now as a class they rather hug. He must be an unusually obstinate individual, who long resists evidence addressed to his ears and eyes, and arguments that appeal to his pocket.

Last to be mentioned, but not least to be preferred among the means of improvement is the reading of agricultural books and journals. To little purpose have I talked, if farmers are yet unconvinced, that agriculture is not only an art, to be acquired by practice and observation; but as well a science, to be mastered only by study and thought. Books and papers are the silent instructors for the fireside, or the neighborly gathering. They contain the rich treasures of other's experience, collected in small compass from many and distant places,—the tale of long years of toil, told on a single page. The farmer who undervalues this cheap and easy mode of instruction, is no Solomon; and he who overlooks and neglects it, is far from being a sage. Show me the men who sweep off your premiums; and nine out of ten of them, I venture to assert, are the reading and thinking farmers. Show me the farmer, whose purse has grown weighty with coin,—whose pocket book is plethoric,—to whom the rustling of bank notes is familiar music; and, ten to one, he is a reader and a thinker.

As is known to you all, the speaker is the editor of an Agricultural Journal; but if, as an editor, he must say that the farmers do not exert themselves as they ought to do, by procuring subscribers, and by communicating information,—to sustain the agricultural press; as a farmer, he can add, with truth, that the poorest paper that is now in circulation, is worth to any farmer, ten times its subscription price. One single article may be, and often times is, worth to a reader ten dollars,—that is, he shall net this amount in a year by adopting a recommendation that he reads; yet we shall hear the same man grumbling, because every page is not filled with matter suited to his wishes. If farmers knew their best interests, they would give their hearty support to—not one, only, but to a half dozen Agricultural papers; and look upon it, as their wisest investment.

Wm. S. King, Boston.

Butter.

I do not propose to go into all the *mysteries* of making and preserving butter, but to give some general facts which those who are desirous of learning may turn to account. It has already been stated, that, cream is a mixture of oil, or butter (for, with the exception of a little salt, it is the same thing,) and curd. The butter in small globules, is wrapped up in little sacks, or bags, of curd.

Now, the thing to be done, in order to make butter, is, to break open these sacks, and let the butter out. When this is done we say, "The butter comes;" and sure enough it does come—comes out of the sacks. Those globules which were before kept apart by the sacks, come together,—thousands of them, and form a particle large enough to be seen by the unaided eye. And now does the reader say, the more violently the churning is done, the sooner will the sacks be broken? Not so. You cannot break them by mechanical force; it is a chemical process. Put them in the right circumstances, and they will break open of themselves. Pounding will not break them. They will slip away from under the blows unbroken, just as a foot-ball will leave your foot when you give it a hard kick, but will leave it whole. Pressure will not break them. Nothing will break them till you put them into *the right circumstances* as to *temperature*, and *exposure to air*.

At 40 deg. Fahrenheit, you might churn from January to March, or at 100 deg., you might churn from June to September, and no butter would come. Or if you were to exclude the air entirely from the inside of the churn, you might roll that churn, with the cream in it, from Cape Horn to Labrador, and the butter would not come.

All the processes of nature have their conditions. The separation of butter from curd is one of these processes. *The conditions must be complied with.* We will suppose that the cream is from cows that give good milk. The farmer is unwise who keeps any other.

Some cows' milk will not give much butter, for, there is not much butter in it. We will suppose also that the milk has been kept at a temperature about medium between freezing and summer heat; that the cream has been taken off while the milk was yet sweet, and has been kept in a cool place till it was a little sour, or was very near the point of souring; that it is now put into a clean churn, and brought up to a temperature of about 60 deg. Fahr., gradually and without much stirring; and that we now begin to lift the dasher, or turn the crank, as the case may be, either forcing air in to the cream by some patent contrivance, or at least letting air have free access to its surface, and now let us see what happens.

By stirring the cream we change the surface often, and thus bring all parts of it successively into contact with the air. The oxygen of the air combines with the curd, and renders those little sacks into which it is formed, brittle, so that they crack open, and let out the enclosed globules of butter. These come together, forming larger masses, until, if the churning be continued long enough *to gather the butter*, as it is sometimes called, nearly the whole will be found in one mass. The curd is now nearly separated. It is floating in the buttermilk. The sugar of milk is diffused through both the buttermilk and the butter, giving a peculiar sweetness to the butter, and also to the buttermilk, if the cream had not become too sour before churning. This is an important consideration; for it is this sugar of milk that performs the double office of giving to the butter a luscious flavor, and of causing it to keep well.

Washed butter may have a tolerable flavor at first, for it will retain a part of the sugar of milk in spite of bad management. But it will have given up to the water too much of its sugar of milk to allow of its keeping for any considerable time. Put down a firkin of butter that has been washed, and another precisely like it in every other respect, but which has seen no water, let them be from the same churning, be put into similar firkins, and kept in the same place, and the unwashed will keep best for an absolute certainty. No more absurd practice ever came into vogue than that of washing butter in floods of water. There is some advantage in washing very rancid butter, for some of its bad properties may be washed out. It may be made tolerable. but if we wash fresh butter, we wash away the part that is essential to its richest flavor and to its preservation. No water should be put into the churn, and none used in the process of working.

The butter should be taken from the churn with a wooden ladle; should be worked with the same; when nearly all the buttermilk is worked out, pure, fine salt should be added; it should be salted to the taste. More salt than is requisite to gratify the average taste for this article, has no tendency to preserve butter, but rather the reverse, unless the salt is absolutely pure, which seldom happens. Most salt contains a little lime, and a little magnesia; and when this is the case, any more than

enough to salt to the taste, not only gives the butter a bitter flavor, but actually hasttens its putrefaction. It is very important that the best of salt, as pure as can be obtained, should be used for butter.

I will here lay down a rule by which the dairy man can tell whether his salt is sufficiently pure for the purpose. To 8 lbs. of salt, in a clean wooden vessel, add one pint of boiling water; let it stand an hour; pour it upon a thick strainer, and let the water pass into another vessel. The lime and magnesia, if any were present, have passed through in the water, together with a part of the salt—possibly a quarter of the whole. What remains on the strainer is nearly pure salt. Let that which has fallen into the vessel be put into the cattles' trough. There need be no waste if all the salt used in a dairy were thus washed. Now, with washed salt, let a lump of butter be salted; and let another, from the same churning, be salted with some of the same salt unwashed. If the latter have a bitter taste, from which the former is free, you may conclude that the salt contains lime, or magnesia, or more probably both; and that the whole should be washed as above described, before being used for butter, or else its place should be supplied by purer salt.

Many a pasture has been blamed for producing bitter weeds, when all the bitterness was in the salt. The pasture was well enough, but the salt manufacturer could make half-purified salt cheaper than pure.

We have said that all the buttermilk must be worked out. This is true, but it is liable to be misunderstood. What is buttermilk? It is water, with fine particles of curd, a very little oil, and a little milk-sugar in it. The particles of curd give it a whitish appearance. Now, the butter must be worked till this whitish appearance has ceased, but not till the last drop of liquid has left it. The best butter in the world is full of fine particles of a transparent liquid. It would not be best to work these out if you could, for the butter would then become tough and waxy. More butter is damaged by not working it enough, but much is damaged by working it too much. The dairy-woman should watch the complexion of what flows from the butter as she works it. When this becomes perfectly transparent, limpid like pure water, with not the least whitish appearance, the operation should cease at once, for whatever is taken out after that is a damage and not a benefit to the butter. It is not buttermilk, it is water, with a little salt and sugar dissolved in it, and is an essential part of good butter. —Nash.

Kelley's Island—Its Position and Products.

Allusion has been made in previous pages of this periodical, to the future fruit prospects of this favored region, but, as few persons are aware of its peculiarly favorable position and climate, I shall take this opportunity to transfer from the columns of the "*Commercial*" newspaper, portions of its correspondence from this island, which will convey a pretty good idea of the place, in a set of notices of its geography, geology, soils, products, and climate, which the writer has served up in a brief but comprehensive style, as though he were accustomed to take rapid birds'-eye glimpses of matters and things in his viatic peregrinations:

Geographical Characters.—This island is of an irregular figure, nearly two miles across from south to north, and about three miles from west to east. The inhabitants found the fertile soil covered with a dense growth of noble forest trees, common to good limestone land, and in the midst of these, and covering the ground in rain grand, were the trunks of perdurable cedars, defying the tooth of time, monuments of the condition of the island when in mediæval period the dense perennial greenery of these cedars offered congenial shelter to the wandering Eries, who have left hieroglyphic traces of their history inscribed distinctly upon the "sculptured rocks" along the shores, which constitute the archæological curiosities of the place.

The Indians, or some pristine race of humanity appear to have found these shores a favorite residence, for numerous earthworks have been traced upon the island, and many remains of their ingenuity in the shape of axes, darts, pottery, &c., are picked up by the present inhabitants, besides the hieroglyphic writings upon the rocks, which have been copied and published by Major Eastman, under direction of Congress.

Rocks and Soils.—The geological formation of this island is a firm grey limestone, often bituminous in its character, emitting a strong odor when bruised, or even when exposed to the sun. This rock is very similar to that at Dayton and at Louisville, and, like the latter, has associated with it some layers of water-lime, from which cement is made. There are some curious fossils in the rocks, which would interest the collector of such things. In the middle of the island, extending from east to west, or nearly in that direction,

the highest land forms a low, flat ridge, where the rock comes near the surface, and is mixed with the black soil. The rock inclines toward the south end to the level of the waters, upon it is a heavy deposit of drift—clays mixed with gravel, pebbles, and some immense boulders. This is a stiff, strong soil, and yields abundant crops. To the north of the middle ridge, is a deep excavation into the rock formation, about a quarter of a mile wide, as though an immense groove had been scooped out across that part of the island. In this is deposited the drift before mentioned, covered with a rich black soil; and to the north is a narrow ridge of rock, called Little Mountain, beyond which is more drift resting upon bold rocky cliffs that form a part of the northern shore of the island. It will thus appear that this tract of country possesses some variety of soils, all of which are fertile and well adapted to the growth of different crops, and the splendid corn, wheat, and other grains, give abundant evidence of their adaptation to these products.

Grooved Rocks.—The grooves and scratches on the rocks are among the most curious and remarkable phenomena connected with the geology of this interesting region; standing here in the previous rocky formations, it is left a landmark to bear upon it the traces of destructive agencies that have scooped out the bed of the lake, and left upon and near its shores extensive accumulations of detritus. Without attempting any philosophical explanation of these wonderful inscriptions, written with styles of flint, upon the extended surfaces of great tables of solid limestone, I shall merely direct the attention of travellers to some of the leading points where these phenomena may be studied. On the southern shore, and especially upon the southeastern point of the island, the rocks all exhibit these curious markings. In either direction from the landing or dock, at the *Island House*, in and near the base of the bold bank of drift which forms the shore, are numerous large masses of limestone, all of which are planished to a smooth surface, or more or less deeply grooved; almost all of these marks are parallel, and bear a nearly southwesterly direction; they have evidently been produced by a force coming from the northeast, for they rise gradually at the easterly end of the blocks, but terminate abruptly at the western end. A fine display, well worthy of investigation, may be found by following the shore eastwardly from the Island House, until you reach the southeastern promontory, which is formed of extensive tables of rock at the waters' edge. The drift having been removed by the action of the waves, the groove scratches are here admirably exhibited, and may be followed in right lines for many yards. Some of the grooves are of enormous size, and resemble gigantic architectural moldings, sharp as though fresh from the stonecutter's bench; others are mere scratches upon the almost polished surface of the rock. The chief action has been in the direction already indicated, but two other systems of marks may be found, one crossing the first at an acute angle, and the third nearly at right angles, being almost north and south; these last are the least decided, and are evidently of more recent formation. Whether the result of *diluvial*, *iceberg* or *glacial* action, I shall not pretend to suggest, but leave every visitor to form his own conclusions. On the north side, also, there are some magnificent exhibitions of these curious geological records, well worthy of investigation.

Natural History.—In its isolated position, this island might not be expected to present an extended catalogue of natural products; yet its flora is quite similar to that of the adjoining main land. The birds appear alst he same, and, like many other islands, it is a favorite resort of the American Eagle which loves the solitude and protection of its mighty forest trees, and finds in the surrounding waves abundant food. Here they construct their eyries in the large oaks, and annually raise their single pair of young birds. Until within a few years there were no quails, but they have been introduced, and are rapidly increasing. The wild pigeons have this year reared their broods in these forests, and are very numerous. All the smaller animals are very scarce; squirrels do not bark at you from the hickory trees, but the grey fox was formerly common, as he is a great traveler upon the ice, each winter afforded him a highway for adventure from the main. The rattlesnake was formerly so abundant among the clefts of the rocks that early geographers mentioned this island as their favorite abode. They disappear before the ruthless heel of man, who was born to bruise the serpent's head.

Fish abound in great variety along the shores, and are caught by the devices of man in great numbers. They are of the kind peculiar to the lake, and constitute quite a source of revenue. They are often carried to the Cincinnati market, but are much better when taken fresh from their liquid element. The delicate white fish is thought to be increasing in these waters.

Climate.—We find here a perfectly singular climate. Surrounded by the lake

the small surface of land is peculiarly affected by it. In consequence of the chilling influence of the water in the spring, vegetation is slow in its advances; but when started, it is never subjected to the blights of a late frost, and progresses rapidly. The summer is sufficiently warm for the perfect maturation of fruits and grains, and the autumn is extended without frosts until late in November. Long after the vegetation on the Ohio river has been blackened by frosts, the dahlias and tender annuals continue to bloom and flourish at this place.

There is said to be very little rain on this island, and certainly drought prevails this summer to a great extent, but I could not hear that any one had kept a record with a rain-gauge. The amount of aqueous precipitation would be very interesting, and the Smithsonian Institution will no doubt furnish the inhabitants with instruments. Little snow falls, and it is apt to off into the lake. The atmosphere is dry, the dew-point being high; fogs and dews seldom appear, and the health of the inhabitants is proverbial.

FRUITS, VINEYARDS.—So far as experiments have been tried, the attempts to introduce fruits have been eminently successful. The apple and pear have been planted extensively for export; the peach can scarcely be expected to do very well upon the stiff soils, but the fruit is said to be fine. Plums have been destroyed by the curculio. The apricot, owing to the absence of late frosts, does not cast its blossoms as with us, and is now in perfection. Cherries begin to bear early, and flourish beyond compare. Strawberries, currants, and gooseberries, are well adapted to this latitude, and are most prolific and of fine quality.

The vineyards are attracting the attention of all visitors, on account of the extreme vigor of the vines, and the abundance of the fruit, even better than in the neighborhood of our city. Specimens taken to Cincinnati were acknowledged to be very fine, and the vine dressers who have been here all yield the palm to the growth and appearance of these vineyards. The success already attendant upon the few acres planted, will induce the rapid extension of the culture, and even should the manufacture of wine never be carried to any extent, the crop of grapes will be of immense value for the supply of the lake cities, which are accessible by water communication.

To "subdue the earth," to render it fruitful, and to keep it so, is the province of Agriculture.

Animal Manures.

Animal manures, while in course preparation, should never be drenched with water, if it can be avoided, for then the potash contained in them, and the soda and chlorine which exist in them in the form of common salt, are dissolved and washed away. On the other hand, they should not be suffered to become entirely dry, as they sometimes will by excessive fermentation, but should be kept moderately moist. If too dry, it is difficult to keep the ammonia. There is another injurious action whic takes place. Farmers generally speak of it as *burning*. They say their manure *burns*. There is more truth in this than would at once be supposed. The manure does burn, or an action similar to burning takes place. Let us see how this is. When wood burns on the fire, its carbon, about half of the whole, combines with oxygen, and passes off into the air as carbonic acid. Its oxygen and hydrogen pass off as watery vapor; and there is not much left. It is very nearly literal truth, to say, that "*the manure heap has burnt down*." What remains is a little carbonaceous matter and a little ash, about the same as would have remained if it had been literally burnt in a furnace. The rest has gone into the atmosphere, and may benefit the vegetation of the globe, but very little of it may fall back on the farm of the man who owned the manure. It will not do to estimate this *burnt* manure by the fact of its being black; for, according to that criterion, swamp muck, just as it comes from the ground, would be better than the richest stable manure. The truth is, *burnt manure*, however *black*, is worth but little—less than half certainly of its original value.—NASH.

The animals usually kept among us are horses, horned cattle, sheep, swine and poultry. It is worthy of inquiry, whether mules ought not in some cases to be added to this list. The arguments in favor of it are, that the mule is very hardy, little liable to disease, capable of thriving on coarse food, requiring less food than the horse, long-lived, and able to perform great labor. For these reasons, it would seem that for some purposes the labor of mules might be advantageously substituted for that of the horse. But for general purposes, including the transportation of persons, the horse must remain in favor; and it may be laid down that horses, horned cattle, sheep and swine, are the animals to consume mainly the produce of American farmers.

Reproduction of Plants.

There is not a more interesting pheaemenon in the history of the vegetable kingdom, than that of the constitutional power of plants to reproduce themselves. The production of seed to perpetuate their species is the grand purpose of their being. The life of many plants is limited to this principal effort, and when completed, they instantly die. This circumstance has gained for certain descriptions of plants the titles of annuals, biennials, and perennials. Annuals spring up, perfect their seeds, and die in the course of one season; biennals require parts of two summers to arrive at perfection; the life of perennials is not limited to the act of ripening seed, but to the durability and spreading properties of their roots. There is another description of plants which do not come in under any of these titles, though their production of flowers or seed terminates their life. These are such as require an uncertain term of years to bring them to perfection, and which is more or less extended, according to the circumstances of the soil and temperature in which they happen to be placed. The *Agave Americana*, commonly called the American Aloe, arrives at its utmost magnitude, and perfects its seeds in the short space of four or five years in its native climate; whereas, when kept as a green-house plant in this country, forty, fifty or more summers must elapse before it puts forth its flower stem, which is the final effort of the plant. Vegetables resemble animals in being sexual, that is, they have male and female organs on the same or on different plants, and without the mutual influences of these, no perfect seeds can be matured.

The greater number of plants have bisexual flowers; in this case there is but little risk of failure of perfect seed, because the essential organs are so near together. Some are bisexual plants, that is, having unisexual flowers distinct from each other, but on the same root. Others are unisexual plants, that is, the male flowers are on one plant, and the females on another. It may easily be conceived, that unless in this last case, both plants stand near together, no perfect seed can be expected. There is yet another disposition of unisexual and bisexual flowers, called polygamous, in which male flowers are on one plant, females on another, and male and female on a third. This remarkable disposition is exemplified in the fig and mulberry. Thus there are bisexual flowers: examples, the tulip and the rose; bisexual plants, as the oak and hazel; unisexual plants, as the poplar and willow; and polygamous or anamalous plants, as is exhibited in the genus fig.

These are the provisions of nature intended for insuring the maturation of seed, and by which the dissemination of the different species of plants is maintained. Even those tribes of vegetables which have no visible flowers, viz., all the cryptogamous orders of ferns, mosses, lichens, hepaticæ and fungi, have nevertheless the hidden power of discharging parts of themselves, called sporules, which are endowed with all the properties of perfect seeds; because, wherever they fall on soil or other substance favorable to their growth, there they fix themselves and prosper.

The tenacity of life of some seeds after being discharged by the parent plant is astonishing! It is a well authenticated fact, that seeds may remain buried deep in the earth for centuries without losing their vegetative powers. On newly broken up land, or on earth dug out from a considerable depth in the earth, plants will appear which have never been observed before on the same spots in the memory of man. Seeds, like all the other members of a plant, have rudimental existence like the ova of animals long before they are impregnated by the pollen from the anthers; but without impregnation they are wholly destitute of vitality. Some fruits, which are the investments of seeds, may arrive at perfection though the seeds are absent or wholly defective. This is invariably the case with figs ripened in this country; the seeds

although formed, are imperfect because we have not got the male tree in cultivation.

Besides the power of reproduction by seeds, plants have other modes of increasing themselves, viz., by offsets and suckers. And it is a remarkable fact, that, in all cases where there is hazard of perfect impregnation by reason of the absence or distance between the male and female plants, or from the rigor of seasons, these kinds of plants are more prolific of viviparous progeny, than others which yield great crops of seed. Instance the fig, the poplar, and the English elm; these if unfertile in seed are lavishly productive of suckers.

Many plants reproduce or increase themselves both by seeds and suckers; and it is observable that these properties are excited more or less, according as either predominate. If many seeds come to perfection, few or no suckers will be produced, and vice versa. This circumstance is made available by practical men to procure whichever best suits their purpose of propagation.

If a tulip or a hyacinth fancier, wishes to increase his stock of bulbs, he must prevent the production of flower stems by cutting off the upper part of the old bulbs; this dismemberment will cause them to throw out an extra number of offsets from their bases. If on the other hand, all offsets be displaced so soon as they appear, both flowers and seed vessels of the season will be correspondingly enlarged. The same effect takes place in the management of tubers or other subterranean stems. Those of potatos for instance, are increased both in size and numbers, by divesting the plants of their flowers as soon as they appear. The Jerusalem artichoke and horse-radish plants, rarely produce seeds, because their strength is exhausted by the production of progeny under ground.

The manner in which plants reproduce themselves viviparously, differs according to the constitutional character of the plant. Some, as the elm and poplar, are furnished with buds on their roots. These sooner or later sprout forth through the surface, and annually increase in bulk and height. Others, as the greater number of bulbs and tubers, multiply themselves by ejecting runners from the crown of the roots. Herbaceous perennials extend themselves in the same way, either by runners under ground as couch grass, or above ground as the strawberry. Some yield living seeds from the vessel where they are matured, as is seen in some species of the onion family; and others, like some of the lilies, produce little perfect bulbs in the axils of the stem leaves. Another mode by which trees extend themselves from their first station, is by the points of their lower branches resting on the ground; these strike root, and thence send up a new birth of stems. This most frequently happens among trailing plants, as the bramble, &c. Another manner of extension is presented by the Banyan tree (Ficus indica), which becomes enlarged without the assistance of either seed or suckers. Roots are produced from the under side of the lower branches; these hang dangling in the air for months before they reach the ground; this at last they penetrate; and become stems to a new head of branches. An old tree of this sort is a most magnificent object; forming concentric corridors over a great extent of surface, not more beautiful than useful in a tropical climate. All these instances may be called natural reproduction; to which may be added the wonderful property of the leaves of some plants which, when fallen to the ground, put forth roots and become perfect plants. This phenomenon is exhibited by the echeveria, malaxis, gloxinia, and others.

What remains to be advanced will be concerning artificial propagation. The first to be noticed is the expedient of propagating plants by layers: this is performed by simply bending a branch or shoot down into a hollow made in freshly broken up soil, confining there by hooked sticks, and covering it slightly with earth. It is usual to make some sort of incision on that part of the shoot which is buried, and which induces the exsertion of fibrous roots, which when sufficiently numerous and established in the soil, become the roots of the young plant, which then may be separated from the mother plant. It is by this means that

the major part of ornamental shrubs and exotic trees are raised in public and private nurseries, when seed cannot be had, or if the kinds do not succeed by cuttings. The shoots of many plants readily strike root and are propagated by cuttings. This is an easy and convenient process, and answers with many hardy as well as tender exotic plants. Some practical judgment is required, as well in choosing the cuttings, as in placing them in suitable soil and in a proper temperature if they be exotics.

There are, however, a good many estimable plants, which cannot be readily propagated by either layers or cuttings. In such cases other expedients are had recourse to; and these are the various methods of budding and ingrafting. The practicability of these manœuvres depends on the congeniality of the respective kinds to be by these operations united. Their sap, membranes, and natural constitution must be similar, without which no intimate interjunction can take place. But as there are many inferior species and varieties of useful plants which serve well for stocks on which to graft superior sorts, the practice of grafting is of the greatest use in the business of propagation and culture of plants, whether for their fruits or flowers. And when the common modes of budding and grafting fail, (as they sometimes do in the case of exotic trees) new plants are obtained by a particular method called "marching." By this plan, neither is the stock cut over, nor the shoot to be worked upon it, separated from its parent; but bringing the two in contact, and disbarking each at the junction, and binding the wounded surface closely together, a union takes place; after which the head of the stock is pruned off, and the marched shoot is separated from the mother, being no longer dependent thereon.—*Pax. Bot. Mag.*

If you taste a corn of wheat in its dry state, you perceive no sweetness; but if you taste it after germination has commenced, you find it sensibly sweet. Thus flour, unless it has been damaged, possesses little or no sweetness. But when you wet it, and then bake it, a part of its starch is turned into sugar, and your bread is sweet.

Propagation of Pinks.

Piping, or increasing pinks from cuttings, is a very simple process; it requires little practice to become an adept in it. Many ladies have we witnessed acquire the art to perfection in one lesson; and, as pinks are quite the pets of the ladies, we will endeavor to give our instructions as plainly as possible, for the information of the uninitiated. Take cuttings from the old plants (the young shoots of this year's growth), commence by stripping off the lower foliage to within two or three joints of the top of the cutting, then, with a keen edged knife, cut off the lower part close under the knot or joint you have selected; when the pipings are all prepared, throw them into water for five or seven minutes to stiffen. The piping bed being ready, press them into the soil about three quarters of an inch, and the same distance apart; give a good sprinkling of water; and as soon as the foliage is dry, put the glass over them. In about three weeks they will have rooted; at this period the glasses may be removed by degrees, first lifting them half an inch on one side for a day or two, and then all around: about the fourth day they may be taken off.

Piping-bed.—Pinks will root as freely under a north wall as any where, and require less attention in shading when in such a situation. Prepare a layer of spit dung (horse manure that is nearly exhausted of its heat), let it be put together thoroughly wet, and beat down with the spade to a level surface; if eight inches in depth, it will be quite sufficient to keep the worms from disturbing the young plants. On this must be placed the compost for the plants to root in, three inches deep. This should also be in a moist state, but not wet, and be moderately pressed to a smooth surface. The compost for the purpose must be of a sandy quality. Leaf-mould, or decayed vegetable-mould, and silver sand sifted fine, equal parts of each. In the absence of the above, any sweet and sandy soil, proportioned as above, will answer; but we give the preference to leaf-mould, from its cool and retentive nature.

The Verbena.

The Verbena has for many years been an especial favorite of ours; and we therefore hope to be excused if we exhibit some enthusiasm in speaking of it as an object worthy of a high place in every well furnished garden. We have no wish to extol it at the expense of other flowers, of which we are general admirers; but, considering its varied usefulness and applicability for ornament, we consider the Verbena has not an equal. How admirably it is adapted for bedding out in the parterre or cottager's garden, or for ornamenting the rugged rock-work, and those pretty ornaments of our gardens, the vase or the rustic basket! It grows luxuriantly on the decaying stumps of trees, blooms in the green-house, and enlivens the conservatory—every where it is at home, and always finds a welcome. But it is never better located than when it is extensively planted in the beds of a well laid out geometrical garden. No flower can boast of a greater variety of color, ranging from the brightest scarlet to the purest white, and in many instances emitting a delicate perfume. Its habit is also so various; in some instances a perfect creeper, in others of erect growth, adapted for training over wire work of ornamental forms. Let us add to all its other excellences, the length of time that well cultivated beds of it will continue in bloom, and we think we have said enough to establish its claim to universal favor. No plant is of more easy cultivation than the Verbena. The beds should be prepared directly after the early frosts have destroyed the old plants. We give them a good dressing of manure, preferring for this purpose the remains of an old cucumber bed, turning up the soil twelve or fifteen inches deep, and leaving it rough, to be well pulverized by the frost. About the second week in April, weather permitting, we level down the soil, and prick it over about three inches deep with a potato-fork, and the beds will then be ready to receive the plants. Place them from twelve to eighteen inches apart, and peg each shoot neatly and securely down, to prevent them being disturbed by the wind. All the attention they will require after planting will be, to remove the pegs from time to time as the shoots elongate. Should the season prove dry, supply them with water, using liquid manure every third time; liberally for scarlets and all high or bright colors, but with caution for whites.

Cuttings should be taken about the end of August, and planted in sand or any light soil, under a north or west wall, and covered with hand-glasses, where, with a little attention, they will be well rooted in about a fortnight.

When this is the case, plant them singly into pots known as thumbs or small sixties (3 inch), using a soil composed of equal parts of turfy loam and peat; place them in a frame, and keep them close for a few days, till rooted into the fresh soil, when they may be exposed by degrees to the full influence of sun and air. Stop every shoot at the second joint, to make the plants bushy. Allow them to remain in the frame till the end of October, then remove them to the upper shelf in the green-house or cold pit, where, with a little stopping and an occasional watering, they will remain very safe (providing severe frost is excluded) till the first week in March, when they may again be removed to the frame (should the season be mild), and exposed as before to sun and air; under such treatment the plants will be dwarf, short jointed, very hardy, and quite prepared for bedding out by the second week in April, and will stand fully exposed to four or five degrees of frost uninjured. Such is the way we should treat the good old established sorts; of course, with the new varieties the case is very different. Propagated in spring, they are unprepared for exposure too early in the season; the safest time for bedding out such plants is about the second week in May. But the great advantage of early planting is, that the garden is gay betimes, and no fear need be entertained but that the plants will continue to produce a very liberal crop of these beautiful flowers till the frost destroys them in the autumn.

TWENTY-FOUR OF THE BEST VERBENAS.

Captivation, bright rose, scarlet spot, striking and fine.
Comte de Paris, rose with blue border.
Defiance, brilliant scarlet, form good, and free bloomer; the best of its class.
Desirable, purple lake, fine form.
Desirable, cream and pink shaded, large and compact.
Diversity, rosy lilac and dark violet.
Emperor of China, color deep, rich crimson.
Empress of Scarlets, a brilliant scarlet, but not good enough in shape for a show flower; a fine thing for bedding.
Excelsa Superb, large, deep rose, fine form.
Fairy. rose, with scarlet centre.
Gem, pale pink, rose centre, fine shape and large.
Lady of the Lake, a very bright rosy pink, flowers and truss very large.
Madonna, rosy pink, with primrose eye, fine trusser.
Magna, a delicate rose of much substance, flowers and truss very large.
Marchioness of Ailsa, delicate pale pink, white centre, good shape.
Miss Sarah, white, pink centre, fine form.
One in the Ring, salmon, very large.
Princess Marie, pale blue, with dark centre.
Rainbow, grey lilac, fine form.
Ruby Superb, bright ruby, light eye, fine form.
Saint Margaret, scarlet crimson, light violet eye, large and fine form.
Satellite, brilliant orange scarlet, yellow eye.
Sir R. Peel, deep peach.
Virgin Queen, large, pure white, good shape.
Vixen, pale pink, fine shape.

THE FOLLOWING ARE OLDER ONES, VERY SHOWY, AND BETTER ADAPTED FOR BEDS THAN SOME OF THE ABOVE.

Alba Adoratissima, blush, with lilac eye.
Amethystina, light blue.
Atrosanguinea, crimson, with yellow eye.
Aurora, pinkish salmon.
Barkerii, dark scarlet.
Beauty Supreme, rose very large.
Bicolor Grandiflora, scarlet, with dark eye.
Boule de Feu, bright scarlet.
Champion, rosy salmon.
Comet, cream, dark center.
Delight, primrose.
Eliza, delicate salmon.
Emma, deep purple.
Favorite, bright rose.
Heloise, rich purple, fine shape; the best of its class.
Imperatrice Josephine, fine deep blue.
Lord John Russell, bright salmon.
Lord Thurlow, crimson maroon.
Merry Monarch, shaded orange crimson.
Miss Harcourt, pure white; the best known.
Mountain of Snow, color pure white; first-rate form.
Reine de Francaise, pink with a rich carmine centre.
Vulcan, rose and scarlet.
Wonder of Scarlets, scarlet.

The Chrysanthemum.

Of all our winter flowers this is perhaps the most useful, and certainly none are more easily cultivated. There is, however, a mode of culture pursued by some, which we think, possesses some advantages over that commonly in use. It is that of raising the plants from layers instead of from cuttings. The benefits arising from this system are, 1st, A greater quantity of plants can be produced, 2d, Greater variety can be obtained in regard to size; a circumstance of some moment, when it is considered that the Chrysanthemum dislikes much stopping. And, 3d, Plants can be raised from layers at less expense and trouble than they can be produced by any other system.

First, then, as regards the production of the plants. As soon as they have done flowering, plant them out on a prepared border, having a west aspect; top-dress with a little well rotted manure, and cover lightly with straw, to protect them from the full rigor of frost, which may probably set in after they are planted. So soon as favorable weather arrives, say in April, cut down the old stems, and encourage growth by forking-in the rotten manure with which they were top-dressed. When of sufficient length, let the young shoots be layered in the pots, in which they are intended to remain, the early layered ones of course requiring the largest pots; stop the shoot at the time of putting them into the pots, and again as soon as circumstances will allow. The tops might be made into cuttings if required; but unless very few plants have been put out, no necessity will exist for this.

2d. As to sizes, great variety may be obtained in this respect by allowing a month to elapse between the layerings, which will also give a succession in time of flowering. By this means, instead of having the plants all of uniform height, we have them of all heights, from three inches to three feet; and in the last layering (which should be effected by the end of July or beginning of August), three or four stems may be tied together and layered in one small pot; these will be in beauty at Christmas. When the pots are properly filled with roots, and the flower buds formed, liquid manure may be given with good effect; it improves the size of the flower. I have seen plants not more than six inches high, with flowers the diameters of which were larger than the mouths of the pots in which they were grown, with foliage hanging over the side of the pot,—presenting, at least, a novelty in Chrysanthemum growing.

3d. By this mode of culture the expenses of production are lessened materially, for no glass is required in striking the layers, nor in starting the plants into growth after they have been potted off. The pots in which they are layered are plunged in the ground, thereby rendering watering unnecessary, and the plants are stronger, from having the mother-plant to support them. Care must, however, be taken to plant them well, leaving room for light and air to circulate freely among the plants.

By this plan of cultivation plants may be obtained in sufficient quantity to allow them to be introduced into the flower-garden when the beauty of other less hardy things has passed by. They may be planted, according to their colors, near the windows of the dwelling-house; and for this purpose the old plants should be only *partly* cut down, training them during the season to the ground, that their leaves may be all in one position, as they would take too long to recover themselves in November if allowed to grow promiscuously, and by growing them a good length they will cover the beds more effectually. In this way a few beds of Chrysanthemums have a good effect, and serve to relieve the gloom of winter, by shortening very considerably its duration. A very slight protection will save the foliage from getting browned, which sometimes happens after frost.

I have found the yellow varieties best adapted for out-door work, being hardier than the white sorts; the dark colored kinds also stand very well.—*London Florist.*

Labor is an important requisite, but not the only requisite of successful husbandry.

The Hardy Magnolias.

The Magnolias are the most magnificent trees among the arboricultural productions of the globe, and stand prominent amid the forest treasures of the United States. The stateliness and grandeur of their growth—the size and verdure of their foilage—and the fragrance and beauty of their flowers, render them at all times, and in all seasons, objects of the greatest interest. No ornamental trees have more claims upon the planter than these. Hardy enough, as several of them are, to endure the rigors of a New England winter, they deserve a place in the garden or grounds of every admirer of elegant trees.

With the exception of the tulip tree, which belongs to the same natural group, no others will compare with them in all that constitutes beauty of form and magnificence of flowers; the oak, the elm, and the maple, each have their merits; but they are of a different character from that of the magnolias, and cannot be compared with them. The oak pleases us in picturesque form, its sturdy growth, its varied foilage, and for the associations which invest it; but the magnolia delights us in the symmetry of its habit,—the breadth of its deep green leaves, the size of its blossom, and the brilliancy of its rich coral berries. In the park the oak would stand conspicuous among all other trees; but on the polished lawn, the magnolia could have no rival but in itself.

Michaux who in his *Sylva* has described and elegantly figured all the fine species indigenous to America, is unbounded in his praise of the magnolias. An opportunity to see them in all their splendor in their native forests, could not fail to impress one, so great a lover of fine trees, with the highest admiration of their richness and magnificence. The M. macrophylla he carried home with him to the Empress Josephine, in whose garden, at Malmaison, it bloomed for the first time in 1811.

The magnolias are all natives of America and Asia, none yet having been found in Europe, Africa, South America, or Australia. They also occupy nearly the same parallels of latitude, from the 28th to the 42d. Michaux states, that of the thirteen species known to exist when he published his work, (1814) eight were varieties of America, and five of Asia; but Loudon, in his *Arboretum*, (1842,) only enumerates twelve species, and one of them a doubtful one, viz., M. pyramidata *Bartr.* Adopting his classification, seven are natives of America, viz., M. grandiflora, glauca, tripetala, macrophylla, acuminata, cordata

and auriculata; and four of Asia, viz., M. conspicua, purpurea, gracilis, and fuscata. But there are many varieties and hybrids of the above, numbering in all about twenty. We shall only enumerate such species and varieties as are known to be quite hardy, or appear to demand further trial, with a view to prove them to be so.

Unfortunately there has prevailed an impression that most, if not all, of the magnolias are partially tender, and very difficult to make grow; indeed, so general has been this belief, that but few of the more enthusiastic amateur planters have dared to try them; this, added to the scarcity of good trees in our nursery collections, has retarded the general introduction of some of the finest trees that exist: and ornamental grounds, that might have now been enriched with superb specimens, are filled with silver abeles, horse-chestnuts, ailanthuses, limes, and other exotics.

It is deeply to be regretted that the most majestic of all the species (M. grandiflora,) cannot be considered sufficiently hardy to stand the climate in the latitude of 42 deg. north. So far as has been tried, it grows tolerably well in Philadelphia, where there is a specimen in the old Bartram garden; but every few years it loses its leading shoots, by the severity of the weather, thus proving that without protection it will not thrive well here. But, cannot hybridization affect something to give it more hardiness? We shall consider this in noticing the species.

The Chinese or Asiatic species are quite as hardy as our natives; hardier than some of them. They are, however, of low growth, some of them, in fact, mere shrubs, yet still beautiful,—very beautiful, particularly M. conspicua. Their hardiness only needs to be known to render them favorites in every garden, however small.

AMERICAN MAGNOLIAS.

Magnolia acuminata.—This species is the hardiest, as well as one of the most beautiful of the family, and equals in altitude and dimensions the M. grandiflora, often exceeding 80 feet in height. The leaves are large, six or seven inches long, and three or four broad, even on old trees; and on young and vigorous ones nearly twice that size. They are oval, entire, and very acuminate. The flowers are five or six inches in diameter, greenish white with a tint of yellow, and have a slight odor. The cones or fruit are about three inches long, nearly cylindrical in shape, from whence the common name, Cucumber magnolia. The seeds are rose colored.

The trunk is perfectly straight, of a uniform size, and the summit is ample, and symmetrically shaped.

This Magnolia Michaux characterises "as one of the finest trees of the American forests." Its large flowers abundantly displayed amid its superb foilage, have a fine effect and render it the most desirable of the large growing species.

The acuminata occupies a great range of territory, extending from the Niagara Falls, its northern limit, (lat. 43 deg.) along the whole mountainous tract of the Alleghenies, to their termination in Georgia, a distance of 900 miles. It grows most abundantly on the declivities of mountains, where the soil is deep and fertile, and the air moist. It is not found within 100 miles of the Atlantic coast, which Michaux attributes to the nature of the soil and extreme heat. It does, however, succeed very well, the Bartram specimen in Philadelphia being now 80 feet high and 7 feet in circumference.

Magnolia auriculata.—Next in size and grandeur to the acuminata is the present species, attaining, according to Michaux, the height of forty to fifty feet. The Bartram specimen, however, is *seventy-five* feet high, and five and a half in circumference. It is quite as remarkable for the beauty of its foilage and the size of the flowers as the last, with this addition to the latter, that they have an agreeable odor. The leaves are narrow, eight or nine inches long, and from four to six broad; and in young trees, one-third larger; the base of the leaf is divided into rounded lobes, from whence its specific name. The flowers are of a fine white. The cones are three to four inches long, and of a beautiful rose color at maturity. The seeds are red.

The auriculata is found growing only in a small tract of country on the Alleghenies which traverse the southern States, 300 miles from the sea; and on the banks of the rivers which flow into the Ohio from Kentucky and Tennessee. Bartram discovered it in 1786. It is most abundant in the lofty mountains of North Carolina.

Magnolia tripetala.—Next in respect to the northern limits of the magnolia, comes the tripetala. It is found in the northern part of New York, but is more abundant further south; it is also plentiful in the western States. Its dimensions are below the auriculata, the Bertram specimen being about forty feet high, and three in circumference. Its leaves are larger than either the auriculata or acuminata, being eighteen or twenty inches long and seven or eight broad, and often displayed in rays at the ends of the vigorous shoots, like an umbrella, from whence its name (umbrella tree.) The flowers are also large, seven to eight inches in diameter,

white, situated at the ends of the shoots, and scarcely so fragrant as the other species. The fruit is conical, four or five inches long, and two in diameter, rose colored when ripe, with pale, red seeds.

The tripetala is a superb tree; its long smooth shoots, its huge foilage, its elegant flowers, and showy fruit forming successively through the year, objects of the most attractive interest. It growth is rapid, and it comes into bloom early, when only ten or twelve feet high.

Magnolia cordata.—This species Michaux remarks, "very nearly resembles the acuminata, and has been confounded with it by the inhabitants of the regions where it grows," and Loudon, in his *Arb. Brit.*, states it is only a variety of that species. It attains about the same altitude as the tripetala, (forty or fifty feet,) and only differs in its broader leaves, which are four to six inches in length, and three to five in breadth, and its flowers, which are yellow, marked inside with a few reddish lines. The cones are three inches long, green, and the seeds are deep red.

The cordata was discovered by the elder Michaux, who found it on the banks of the river Savannah, in Upper Georgia, and on those of the streams which traverse the back part of South Carolina. It never makes its appearance in forests, but only in isolated situations, along the banks of rivers.

This species is rarely met with in cultivation; and is less known than either of the above, though Michaux speaks of it as "resisting an intense degree of cold," and therefore a most interesting one to amateur planters. It will thrive in our climate, and should be generally introduced.

These four species are perfectly hardy, and will grow in any good locality throughout Massachusetts, and probably much further north. Fine specimens of the three first may be found around Boston, particularly in the Botanic Garden at Cambridge.

Magnolia macrophylla.—This remarkable species has generally been considered too tender for our climate. It grows freely in Philadelphia, and there is a tree in the old Bertram Garden, thirty feet high, and twelve inches in circumference. We think it deserving of a more general trial; and believe it will be found quite hardy. It loves a good generous soil, and a dry substratum; like the ailanthuses and many other trees, it soon perishes if the roots are soaked with water all winter.

It is the most rare of all the native magnolias, being only found in the mountains of North Carolina, and in Tennessee; always sparingly dispersed, only a few trees being found together.

In its general appearance it is like the tripetala, and it is always accompanied in its native forests by that species. The leaves are very large, often measuring *thirty-five* inches long, and nine or ten broad; they are oblong oval, and heart-shaped at the base. The flowers are the largest of all the magnolias, being frequently eight or nine inches in diameter, and of a fine white, with a small deep purple spot as the interior base of the petals, which are six in number; they also diffuse a fragrant odor. The cones are four inches long, and rose colored.

Nothing can exceed the magnificence of its numerous blossoms, set off by the rich and luxuriant foilage which surrounds them. It appears to us that no care or expense should be considered too great to thoroughly test the hardiness of this superb species.

Magnolia grandiflora.—There can be but little hope of acclimating this species; certainly as regards majesty of form, magnificence of foilage and elegance of flowers, it is the finest tree in the world. Bartram says its trunk resembles a "beautiful column," and its dark green foilage "silvered over with milk white flowers." It attains the height of eighty to one hundred feet. The leaves are about a foot long, and three or four inches wide, evergreen, thick, smooth, glossy, and very brilliant on the upper surface. The flowers are six to eight inches across, and appear at the ends of the last year's shoots; they are white, and so exceedingly sweet as to be overpowering to many persons.

It is found growing as far up the Mississippi as Natchez, and as far east as North Carolina, and is very abundant over an extent of 2000 miles of territory. It grows in cool and sandy places, where the soil is loose, deep and fertile.

Thoroughly protected, no doubt it would grow well in the latitude of 42 deg. north. But a tree that requires this trouble can never become a popular variety; the only hope is in the production of hybrids, which will not take away its evergreen character, but render it more hardy. The French and Belgian Catalogues enumerate a variety which thrives where the grandiflora will not grow; it is called the Magnolia, grandiflora, var. gallisoniere, and we hope its hardiness will be tested.

These two species, the grandiflora and macrophylla, we have introduced here to render planters and amateurs more familiar with their beauties and claims upon their attention. We cannot consider them yet among the hardy species.

ASIATIC SPECIES.

Magnolia conspicua.—(The Yulan mag-

molia.)—This species is said to have been first cultivated in China, in the year 627, and has ever since that time held the first rank as an ornamental tree in their gardens. In its native country, when full grown, it attains the height of thirty or forty feet. The largest plant in Great Britain, in 1835, when it was measured for Mr. Loudon, was twenty-seven feet high, and at that time had open 5,000 flowers! It is quite rare in our gardens, and but few specimens of any size are to be found.

The conspicua assumes a regular conical shape, with numerous branches and twigs, and the flowers, which are milk white, expand before any of the leaves, blooming in April or May. It blossoms when only two or three feet high, and grows so well as to reach the height of ten feet in six or eight years.

It is a perfectly hardy species, standing a temperature of 25 deg. below zero, without the least injury. A fine plant of it on the elegant grounds of T. Lee, Esq., Jamaica Plain, blooms beautifully every year. It is quite as hardy as the hardiest of our American kinds.

It grows readily, preferring a deep, rich mellow soil, in a rather dry locality, and while quite small, if in a bleak place, may be slightly protected with a few pine boughs; but as soon as well established it needs no more care than the hardiest shrub. No garden should be without it.

Magnolia purpurea.—A smaller growing species than the conspicua, found in Japan, and introduced to England in 1790. Its height is about ten feet, when full grown. Stems numerous, not much branched; leaves large, deep green; flowers large, rich purple on the outside of the petals, and nearly white within, the contrast of the two colors rendering it peculiarly beautiful. It should have a light, rich earth to grow in, and a dry subsoil, when it will prove quite hardy, and a most ornamental species.

Magnolia Soulangeana. — This so closely resembles the conspicua when not in flower, that it is difficult to distinguish it. It is a hybrid raised at Froment, near Paris, by the late Chevalier Soulange Bodin, and supposed to be between M. conspicua and purpurea, as they stood near together. It only differs from the former species, in having its flowers slightly tinged with purple. It is a fine shrub, and with the other hardy ones, indispensable in every fine collection.

These are all the hardy species of this grand tribe, and they are deserving of far more attention than they have received. We commend our account of them to every amateur and lover of trees and shrubs; and though longer than we intended to make our article when we commenced, we hope they will find it worthy of their perusal.—Mag. of Horticulture.

The Butterfly Plant.

The curious in botanical novelties will be gratified to learn that a fine specimen of this singular and beautiful plant can now be seen in full bloom at the National Greenhouses, (Botanical Garden). The blossoms are large and yellow, with reddish brown spots, and move about by the least breath of air, resembling very much in form some gaudy insect. This individual plant was brought from the Island of St. Thomas by the Rev. Mr. Fisk, chaplain on board the United States frigate Raritan, during her last cruise, together with many species of *Air* and other interesting plants from the various countries visited by that ship.

The above is from the National Intelligencer. The plant is the Oncidium papilio, of the wonderful family of the Orchids. The leaves are generally striated and acute, and frequently spotted. The flower-scape arises from the base of the bulb, and is from two to three feet long. The long linear erect petals of the flower are of a rich purple, with a few transverse bands of greenish yellow. The lateral sepals are of a bright motted yellow with irregular bands or blotches of orange. The middle lobe of the lip is of a bright yellow, with a broad irregular border of orange-red. The crest is white, marked with yellow and red. Immediately above the wings are slender fleshy processes, tipped with glands, of which the two upper are the longest and preserve the appearance of two tentacula with eyes at their extremities. This is one of the most beautiful and the most singular of all the species of oncidium. There is no more singular and striking flower in nature. The superior beauty of its bloom should commend it to the notice of florists. Its specific name *papilio*, (butterfly) was given to it by Dr. Lindley, from the resemblance it bears to one of those insects; and its singular form, poised like a richly painted butterfly on the top of its long slender flower-stalk, justifies the appropriateness of its appellation. It is a native of Trinidad, and

is readily increased by dividing; the soil shoud be light fibrous peat mould, well mixed with drainers; the pot, indeed, should be half filled with drainers. It requires a humid stove when growing, but according to Knowles, an English florist, like many of its kind, should be kept cool and dry during its dormant period. Shall we ever see one here?

Study of Nature.

[The following Essay by Miss Louisa Van Norman of the Rutger's Female Institute, received the prize of a gold medal for the best composition in one of the departments of that institution at its recent annual commencement. It expresses many strong and inspiring thoughts].

> "In the vast and in the minute, we see
> The unambiguous footsteps of the God
> Who gives its lustre to an insect's wing,
> And wheels his throne upon the rolling worlds."

To scan with intelligent eye the ascending links of Nature's wondrous chain, from the smallest animalcule up to the grand center of the planetary system, is the glorious province of man, a province which marks his dignity and proclaims his lofty destiny. Though not permitted as an architect or a dictator to enter the grand temple of the universe, yet as an admirer and learner, he may freely range through all the magnificent scenes, and familiarly interrogate Nature respecting her works. Here his spirit, expanded by ever-enlarging and brightening conceptions, ascends to "Nature's God," and revels amid the uncreated glories of the Infinite.

The study of nature is the study of God; for here has he represented in visible glories his "eternal power and Godhead," and made known to the sons of men "His mighty acts and the glorious majesty of his kingdom." Upon the earth beneath, and the heavens above, in every form of nature, organic and inorganic, the Creator has stereotyped a living alphabet, by which the student of nature can read the infinite skill, omnipotent power, unceasing benevolence, and unfailing wisdom of the universal Architect—an alphabet which, vocalized by earth's myriad voices, greets the ear in the zephyr's sigh and the tempest's howl, in the streamlet's purl and ocean's roar, in the insect's hum and the thunder's peal. Thus while his mind, by the expanding impress of the all-pervading Presence, soars above the polluting atmosphere and paltry pursuits of the world, a feeling of profound humility clips the wings of towering pride. As he looks abroad upon the stupendous array of the Divine glories, and wanders amid the systems of worlds which form for him a canopy of unfading fire, he exclaims, "When I consider the heavens, the work of thy fingers, the moon and the stars, which thou hast ordained, what is man, that thou art mindful of him, or the son of man, that thou visitest him?"

His heart thus penetrated and subdued, and taught to feel the hallowing impress of that love which garnished and spread out the heavens, is inspired with adoring reverence for Him who stoops to paint and prop the tiniest flower and nerve the insect's wing. In what others call nature and instinct, he has learned to recognize the wisdom, love, and power of the omnipresent God, and his heart echoes, "Great and marvelous are thy works, Lord God Almighty! Who would not fear thee and glorify thy name?"

How impressively does the study of nature exhibit the condescension of God to man, especially in the work of redemption! When the student of nature looks upon the heavens and remembers that God "sitteth on the circle of the earth, and all the inhabitants thereof are as grasshoppers," or when he penetrates the depths of the earth, "which is his footstool," will he not ask with Solomon, "Will this God in very deed dwell with man upon the earth?" and exclaim with St. Paul, that "the love of God, which is in Christ Jesus, passeth all understanding!" But even in this mystery of loving condescension, he finds ground of faith; for beholding God in the revelation of his works, where all is unsearchable mystery, from the sun-beam mote to the rolling sphere, from the microscopic insect to the leviathan of the deep, his mind is prepared to see him in the mysterious revelations of his word. Here also he finds an antidote against despondency; for he who clothes the lillies of the field and marks the sparrow's fall, will much more care for and protect man, the noblest work of his creative power. In decaying and reviving vegetation, in vernal life from wintry death, is shadowed forth the resurrection morning, and his heart is inspired with the full assurance of hope, that though all else be dissolved, "yet man shall live again," restored "by the energy of that mighty power whereby God is able to subdue all things to himself." As mists before the rising sun, the phantoms of superstitious hopes and fears vanish from the horizon of a mind thus expanded and illumined by a knowledge of Jehovah's works. Sun moon, and comets, fiery skies, earthquakes and tempests, all appear but harmonious

adjuncts or well-timed episodes in Nature's sublime oratorio.

Not only are the sublime and awful in nature intelligibly significant to her devout and earnest student, but even in the most minute he discovers marks of divine benevolence and power. With the organization and habits of myriads of living creatures, for which the finest needle-point would be an ample theatre, he becomes familiar; and thus to him all nature's works are invested with an interest unappreciated by those who look on earth and skies with vacant eye. As a flute in the hands of one who knows nothing of its stops, so is the earth to one unacquainted with its mysteries; and as the musician can make the dry reed discourse most excellent music, so the philosopher can find " books in the running brooks, sermons in stones, and good in everything."

The study of nature gives man almost unlimited power. He looks through its various departments, discerns their relations, connections, and dependencies, and the means by which he can render them subservient to his improvement and happiness. From his terrestrial "stand-point" he measures the dimensions of his earthly ball, and the speed with which it pursues its unwearied way, and traces the exact path it follows. He unravels the mystic dances of the other heavenly bodies, weighs them in a balance, and estimates the strength of the invisible cords which bind them all together. He unfolds the strata of the globe as the leaves of a ponderous volume; and in the hieroglyphics traced there by God's own finger, deciphers well the hoary chronicles of ages past. He fits the earth for the purposes of agriculture, brings water from the depths below, and thus holding the earth in his hands, he verily subdues it. He guides the lightning in its lurid course, or binds it in fetters; makes it the winged messenger of thought, or compels it to do his bidding as a motive power. He converts invisible vapor into iron-sinewed, well reined coursers, and yokes them to his chariot wheels. He arrests the sunbeam, and compels it to divulge the secret of the rainbow. He makes the sun his painter—the sun himself, that grand, old, universal painter, whose glorious pencilings clothe earth and sky with continual beauty. Nor has the student of nature reached his final goal of power, for this must be commensurate with his field of vision, and with its expansion continually increase. Notwithstanding the comparatively glorious results which thus far have crowned the researches of mind in nature's field, science is yet in its infancy. The alphabet has not yet been mastered. Even the leaves of the mighty volume have not all been turned, nor met a hasty glance. Could we peer into the mystic future and see our race advanced from mental infancy to manhood's vigorous life, how would the present dwindle to an age of baby prattle and gewgaw trifles! Since the nursery of man's infancy presents a theatre so complicate and glorious, what must be the field adapted to his manhood's powers! Since here, he gathers about him so much dignity, where his field of vision is comparatively limited, and his power are fettered, to what unimagined height shall he attain, when emerging from the chrysalis, he "feel at home," where angels dwell!

Annuals.

The culture of Annuals, so simple and convenient in itself, and so entirely within the ability of every person in command of a spot of ground, has two great advantages over the culture of every other class of flowers. In the first place it is attended with less expense than any other description of flower culture: and then, what is an important consideration, all the enjoyment to be derived from it, is obtained within the period of six or eight months. The reward promptly follows the little care and labor bestowed. Perennial herbaceous plants are never in perfection, till the second year of their growth; and like bulbs, can only be beneficially grown by such persons as anticipate retaining the occupation of their gardens for several successive years. With annuals, the case is more promising, and the return is more speedy. The seeds of annuals cost but a trifle, and their culture is very simple and light. The sowing, stirring the soil, thinning, weeding, staking, is clean and pleasant labor, easily accomplished by ladies and children; and the effect produced is as great as that of the more troublesome and tardy perennials and shrubs. Annual flowers are above all others, suitable for the gardens of suburban residences, which are hired for a year or a short term of years. The cultivator is sure to reap the full advantage and product of his labor. They are equally fitted for decorating our city gardens, and peculiarly so for such as are defective in soil, situation or exposure.

The French Exhibition for 1855.

The war in the East will neither prevent nor delay the pacific manifestation to which the Emperor has invited all the nations of the world. The progress of intelligence no longer permits one state, whatever it may be, to stop the others in the accomplishment of their destinies. All civilized nations understand this. France, therefore, notwithstanding the pre-occupations of this war, has not for a moment ceased to prepare herself for the universat competition of 1855 any more than she has interrupted her national works. At the same time that she completes her railways, her canals and her ports; while she improves and renders more healthy her capital and her large cities, and constructs dwellings for her working classes; she is making every arrangement to give a proper welcome to the nations who will next year visit her from every part of the globe.

These nations have not only responded to her call, but their declarations and their preparations announce that, with one exception, they will all be faithful to the appointment. The Imperial decree instituting the Universal Exhibition is dated the 8th March, 1853. On the 26th March the Minister of Foreign Affairs notified it to all the governments, and on the 31st of the same month the Ministers of War and Marine made it known to French Africa, and our colonies. On the 8th of April a circular of the Minister of Commerce requested the prefects to invite the efficacious co-operation of all the chambers of commerce, and in the latter end of May the *Moniteur* published the replies and the adhesions of the departments and of foreign governments. In order to complete the idea of the Emperor, a fresh decree of the 22d of June connected the Universal Exhibition of the Fne Arts with that of agricultural and manufactured productions, and the decree of the 24th of December instituted a commission, composed of the most competent men, and charged, under the presidency of Prince Napoleon, to regulate the *ensemble* and the details of the universal exhibition.

The experience of previous national exhibitions, and the documents relating to the universal exhibitions of London, Dublin, and New York, have furnished to the Imperial Commission some valuable information, of which it has known how to take advantage. Penetrated with the importance of his mission and with the responsibility which it imposed on him, the Prince formed a sub-commission, with which he could prepare all the measures necessary to secure the success of the great enterprise. Organization of the central administration, internal and general regulations, constitution of native and foreign committees, general and special instructions for France, for the colonies, and for other nations, appropriation of the space which is to be filled by the different productions of agriculture, industry and the arts; all these preparatory labors the Prince was desirous to bring to a termination before he started for the East, to share in the dangers and in the glory of our soldiers.

The decrees, regulations, and instructions relative to the universal exhibition are now circulated in all parts of France and of the world; and already committees have been organized, or are on the point of being so, in the greater number of our departments. The first marks of sympathy which the announcement of this measure obtained abroad are every day confirmed by fresh acts of adhesion. Among these acts there are none more significant than the local exhibitions, which are, as it were, so many preparations for the universal one. The Grand Duke of Tuscany has anticipated by one year, the exhibition of industry which was to have taken place in his states in 1855, in order that it might not clash with that of France. Spain has done the same for her quinquennial exhibition. The King Regent of Portugal has just organized commissions of industry and of the fine arts, as well as auxiliary committees, in the provinces, islands and colonies of his kingdom; he has made the most pressing appeal to manufacturers and to artists, and has ordered that an exhibition shall take place at Lisbon, preparatory to that in Paris.

All Germany has sent her productions to the semi-universal exhibition which is to open at Munich on the 1st of May. From four thousand to five thousand exhibitors are reckoned on: the most liberal measures have been adopted by the German government for the success of this exhibition, the most remarkable articles of which will doubtless figure in the Great French Exhibition. It is known that Belgium is also preparing an exhibition of the fine arts for the same object. The co-operation of Holland, as well as that of the United States, is assured to us. Lastly. England is preparing to return with *eclat* our visit of 1851. Two delegates of the English government have just arrived in Paris, to come to an understanding with the Imperial Commission on all points connected with the productions which Great Britain is to send to the Universal Exhibition. In this immense competition of all nations, the government relies with confidence on the zeal and skill of our manu-

facturers and of our artists to support worthy their reputation and the glory of the country.—*Moniteur*.

Grape Stakes and Fence Posts.

A French gentleman of this city has sent us a note, conveying a process for the preservation of these essential auxiliaries to the Vineyard and Farm, of which the following is a translation. We invite the special attention of our readers to this matter, believing it to be of great economical importance :

CINCINNATI, August 15, 1854.

GENTLEMEN : The cost of renewing the stakes of our vineyards is considerable, and invites your attention. I wish to bring to your knowledge the following process for their preservation :

Put in an open barrel sulphate of copper, or blue vitriol, which dissolve in water, in the proportion of two pounds of the sulphate to four and a half gallons of water. Stir until the salt is completely dissolved. Into this solution plunge the ends of the stakes to be inserted in the ground, and leave them there 48 hours, when they should be removed and dried in the shade. Repeat this operation until the wood attains a bluish color. When this is done, and the stakes are again dried, give them a good coat of whitewash.

Stakes prepared in this way have not only a very long duration, but they are never injured by insects.

I. POURNIER.

The following narrations in this connection, from the *Working Farmer*, will be read with interest :

POSTS FOR FENCES.

MR. FREAS : Where it is necessary as it generally is to erect farm fences with posts, it is a matter of some importance to secure such materials as will be most durable. Oak, ash, chestnut and cedar, are used in different States, and all, perhaps, have a higher degree of value than other kinds of native wood. Yet the natural durability, or power of resisting decomposition, which these woods possess, may be very materially increased by art. The practice of setting posts in a reversed position, or with the tops in a direction contrary to that of growth, is highly recommended by some writers, and in many cases where the experiment has been made, its result appears very strongly to favor the theory upon which it is predicated. Still we are in possession of no reliable data which can be regarded as sufficient authority for an unqualified recommendation of the usage, and must await farther developments, ere we accord to it the importance which its numerous and in many instances, intelligent advocates, assume for it.

But there can remain no doubt in the mind of any person, tolerably well informed on scientific subjects, that there are many ways in which the durability of wood, when placed beneath the soil, can be increased economically. Nature herself teaches us this fact. If, for instance, we desire to secure the durability of a fence post, we know that charring the portion exposed to the action of the soil, will enable it to resist decay. Charcoal, we have all of us seen, is almost indestructible when inhumed in wet or moist situations ; and hence, if we create a coat of this substance around the sides, and over the lower end of a post, we infer that it will not speedily decay, or rot. Perhaps of all methods of resisting this contingency—always unpleasant, and often expensive to the farmer, charring, is alone the most economical and effectual. Posts that rarely last more than eight or ten years, may thus be made to endure twenty or thirty. This is not mere theoretical assertion ; it has been actually and repeatedly demonstrated by experiment, and its truth could be coroborated by the testimony of hundreds. Kyanizing, or the process of first exhausting the air in the pores of wood, and then filling them with some mineral solution, is another method ; but this is too expensive for most farmers. The wood so prepared, however, becomes almost as hard and indestructible as iron, resists friction, and is applied to uses where all the strength and impermeability, as well as rigidity of iron, is required. In a long run, it would, no doubt, richly remunerate one for the expense, but at present it can only be made available on works where large capitals are employed. The abundance of acid contained in the sap, is one of the principal causes of rot. Hence the steeping of it in solutions of potash, lime, or in strong ley, tends to promote its durability, as the alkalescent liquid destroys the acid, and frees the wood from its action.—*Germantown Tel.*

We copy the above for the purpose of endorsing its truths and objecting to such portions of the article as we conceive to be erroneous.

There can be no doubt that the charring of a portion of the posts to be inserted in the ground, materially increases their durability, as the antiseptic property of the charcoal formed, must have such an effect. It is also true that reversing the posts relatively to the position of their growth will

cause them to last a greater length of time.

When the lower or butt end of a log is placed in water, the water will rise in the capillary tubes, and thus, by the combined effects of moisture and atmosphere, decay will ensue. When the position, however, of the log is reversed, and the upper end placed downward, the water will not rise, and hence the conditions for decay are not so readily present.

We should, however, differ widely from the writer of that article in his assertion that the introduction of salts, proper for the preservation of wood is too expensive for the use of the farmer; for many salts may be used with great profit, materially increasing the durability of the wood.

The cause of the decay of wood is principally due to the presence of vegetable albumen, and if this be coagulated by the use of such mineral salts as will render it insoluble, the ordinary conditions for decay will be arrested; thus, in a hogshead or tub containing a dilute solution of corrosive sublimate, chloride of zinc, or sulphate of iron, posts may be immersed to the depth intended for insertion in the ground, and the vegetable albumen contained in the capillary tubes of the wood will be coagulated and rendered indestructible, and that too, without material cost.

The most effective of these substances is corrosive sublimate, discovered by Mr. John Kyan, of England, the inventor of the Kyanizing process.

Some of the sleepers of the Amboy railroad were Kyanized, and after having been in use for more than twenty years, are still perfectly sound, while those not so treated, have required renewal.

In the Woolwich dockyard, in England, a number of posts were Kyanized more than thirty years ago, and still they are found to be in a perfect state of preservation, while those not so treated have required frequent renewal.

The chief decay of posts occurs at the immediate surface of the ground, where moisture and air more frequently meet and exercise their combined influence. A hole bored in a post immediately above the surface of the ground, and a small portion of corrosive sublimate thrown in this hole, and then closed by a tarred plug tightly driven in, will preserve the posts for a long time from decay. This hole should reach from the outside to the centre, and the slow solution of the corrosive sublimate from the slight amount of moisture sustained in the post, and renewed there by natural causes, will disseminate it throughout the portion most likely to decay

We cannot agree with the writer that the alkalies will preserve wood. It is true that small portions of lime may be used, because it is soon converted into carbonate of lime, by the carbonic acid of the atmosphere, and thus loses its causticity; but soda, potash, and the other alkalies will decompose woody fiber very rapidly even after becoming carbonates. If the amount used would only be sufficient to neutralize acids in the wood, forming soluble salts with such acids, and then passing away by solution, the effect might not be so deleterious; but the slightest excess of alkali so applied, would materially accelerate the decomposition of the work.

Sumac.

The importance to the economical arts of this country of all articles containing tannin, gives value to the following notes on the American species of Sumac, from the New York Tribune. The article is from the pen of Mr. W. R. Prince. The European species, most valuable for tanning properties, is the *Rhus coriaria* of Linnæus; or the cuvrier's sumac: so called because the bark of the plant, and indeed, other portions of it are of ancient and modern use in tanning leather. This species is a hairy, dwarfish shrub, growing chiefly in thickets, seldom exceeding five or six feet in height. The leaves are alternate, pinnate; leaflets oval, lanceolate, dentate, velvety. The flowers are of a greenish white, small, numerous, densely paniculate upon the extremities of the branchlets, and appear in the spring. The berries are red at maturity. The plant inhabits dry, stony places, in the South of France, in Spain, Italy, Barbary and other European localities. The plant is dried, reduced to a powder, and so used for tanning skins; and particularly in the preparation of morrocco from goat skins. The fruit is of an agreeable acid, and is much used, in domestic drinks and confectionaries, especially by the Turks.

The Sicilian Sumac is a rather tender shrub for any latitude north of New York. It would succeed in New Jersey and to the south of it. With regard to our native sumac, we have four and perhaps five, species that possess a sufficiency of tannin to render them valuable for domestic use and for commerce. It will be requisite to test them all in order to select the preferable species for extensive culture. The species

found so common in neglected fields and along the road-sides is the *Rhus glabrum*, producing crimson berries in large clusters, and it is this which has already been made use of to some extent, more especially in Connecticut and other eastern States. Its usual hight is about 4 1-2 feet. A taller growing species is also quite common, and is the *Rhus typhinum*. It usually attains the hight of 10 to 12 feet or more, with small clusters of dingy red berries. A third species is *Rhus copallinum*, which is quite common in dry woods and fields, more especialfy where the soil is sandy. This species has more resemblance to the Sicilian sumac, than any other American species, in its foilage, and its gray bark and growth. It attains a height of 4 1-2 to 5 feet, and produces dull reddish berries in small clusters. I should incline to the belief that this is the preferable native species, for tanning, and fortunately it is disseminated far to the south and west, though seldom found north of New York. The Indians of the Mississippi and Missouri make use of the leaves of this species as tobacco. A fourth species is *Rhus aromaticum*, which is not found in this State or to the north or east of it. Its most northern limit is Pennsylvania, thence extending to Carolina, and to Kentucky. This is a shrub of about fourfeet in hight with *trifoliate* leaves, which distinguish it from all the other species. It grows naturally in moist localities. The leaves when rubbed omit a very strong odor. The four species I have described do all possess tannin to a greater or less extent. A fifth species in regard to which I have doubts, is the *Rhus vernix*, or poison sumac tree. This is found usually in low grounds, and attains a hight of eight to ten feet. The leaves are pinnate and resemble those of the ash so much that it is often called poison ash. Its berries are white. Every part of this small tree is poisonous, not only in its growing state, but, as I am assured by those who have suffered from it, even when vegetation has ceased and no sap is flowing. Having now reviewed all the species which may be applied to the object desired, I will refer to a Chinese species, *Rhus succedanum*, from which the red lac is made, and which might be introduced and cultivated here. It is singular that so many useful and so many poisonous shrubs should be comprised in one genus. In addition to the poisonous species already described, we have in plenty around us *Rhus toxicodendron*, or poison ivy, a vine which runs over so many fences, and climbs so many trees, and in Pennsylvania and Virginia, *Rhus viridiflorum*, also very poisonous, and there is also *Rhus pumilum* a dwarf shrub found most plentifully in Vermont and Lower Canada, and also said to grow in Upper Carolina, which is deemed the most poisonous of all. In California they have the yedra or *Rhus viride*, which abounds in the mining districts, growing under the oak trees, and is the only plant there that looks green and flourishing during the torrid heat of summer. Most woefully have the miners suffered from this poisonous plant. In the island of Java there is a poisonous species, *Rhus Javanicum*, so celebrated for its deleterious properties that it has been sometimes confused with the bohon upas tree of fabulous notoriety. There is another species found at Macoa, and one in Barbary, and above a dozen species are natives of the region about the Cape of Good Hope, but of these the peculiar properties are unknown.

Labor a Condition of Happiness.

There are seasons in the experience of every amateur gardener when he is disposed to shrink from the bodily exertions required by his pursuits; in the heat of summer he dislikes to leave the cool shade to perform the manipulations which expose him to the fiery beams of the sun; and the attractions of the fireside in winter render open-air duties, amidst snow and rain, anything but attractive. In moments of listlessness and languor, the interests of Flora run great risks of being postponed to the indulgence of ease, until the blooming of some favorite flower, the peeping up of bulbs from beneath the snowy ground, or some other beautiful natural development, excites afresh our latent associations and sympathies. Perhaps there is no reader of this work who will not plead guilty to this occasional treachery to his favorite occupations.

While the love of flowers will generally prove a sufficient motive to exertion, it will be desirable that the gardener should habitually recognize the great law of our being, which makes physical labor necessary for our happiness. The sentence pronounced upon our race by our kind though offended Creator, "In the sweat of thy brow thou shalt eat bread," must, doubtless, have some *punitive* aspects; but the actual working of the curse by the transmuting power of divine benevolence has been turned into a blessing. Labor may be badly compensated, and too severe to allow of the glow of health, and the buoyant and happy thoughts which health encourages; but, under certain restrictions, it is eminently calculated to do us good. The mechanism of our bodily stucture demands exercise for its progressive march to perfectness, and when its full stature is obtained, labor must

be employed to knit the parts into firmness and prevent them from rusting. The muscles of a blacksmith's arm standing out in high relief, compared with the smooth uniform surface of the same limb in the case of a man of sedentary pursuits, tell a tale, the moral of which is unquestionable. Beauty of form, and firmness of texture are more dependent on labor than the luxurious habits of our high civilization dispose us to admit.

The finer organization of the mind is intimately dependent on the grosser construction of the body, and cannot free itself from its influence ; this is painfully evident in the immense variety of mental diseases derived from corporeal sources. How important to make health and strength subservient to those intellectual operations which are the glory of our being, linking us as they do to more noble spirits than our little planet can boast of! The upturning of the soil, the exercise of nerve and muscle in rolling a grass lawn, and all the minor labors demanded of the gardener, are highly promotive of that healthy bodily state without which the mind must suffer. All persons engaged in literary occupations, all Christian ministers, and all clerks in public offices, should become amateur gardeners. Among the higher classes, field-sports counteract the tendencies to idleness which wealth often entails upon its possessor, and the steeple chase and the fox hunt secure for the pulse a healthy play. Let not those whose circumstances will not allow of these robust sports complain that their daily duties injure their health and cloud their intellectual vision until they have fully tried the invigorating influence of gardening.

Labor is productive of direct pleasures ; in the very act of working in moderation, there is a satisfaction which amply repays for every sacrifice. I imagine you are in an uncomfortable state of equilibrium on some bleak day in December, now resolving to plant some trees, and now inclining to continue at the fire with some attractive book. Take courage, and throw the volume aside ; doff your light dress for one suitable to the season, and, with stout coverings for your feet, go boldly forth. At first you will look blue, and feel rather dissatisfied, but every stroke of the spade will bring the right color to your cheek, and better feelings to your heart. Soon you will experience a glow without and within, and enjoy your labor highly, until the shades of evening allow you to go in and delight yourself with that greatest of all bodily luxuries, REST AFTER TOIL. Let my fair readers remember I am now writing or *them* as well as for my own sex.

HENRY BURGESS.

Brief Historic View of the Kew Gardens.

It is generally known that considerable changes in the Royal Botanic Grounds of Kew were contemplated about the year 1840, when, from being a private garden belonging to the Royal Family, and maintained by funds from the board of Green Cloth, it was liberally relinquished by her present Majesty, Queen Victoria, and placed under the control of the Commissioners of Her Majesty's Woods and Forests, with the view of rendering it available for the general good. The public, having since been freely admitted to the Gardens under a few needful regulations, must have observed the many alterations and improvements effected under the sanction of the above-mentioned Commission.

About the middle of the seventeeth century, the spot that now forms the Royal Gardens of Kew, together with a residence called *Kew House*, belonged to R. Bennett, Esq. Kew House and Grounds then passed into the hands of Mr. Molyneux, who was secretary to King George II. (when Prince of Wales), and who married Lady Elizabeth Capel. He was well known as a man of literature and an astronomer. With an instrument of Mr. Molyneux's own construction, and in those very grounds, Dr. Bradley made the valuable discoveries relating to the fixed stars, to commemorate which an inscription was placed by the late King William IV. on the pedestal of a sun-dial, which stands on the identical spot which had been occupied by Dr. Bradley's telescope, upon the lawn, opposite to the present palace.

The Prince of Wales, who was son to George II. and father to George III., admiring the situation of *Kew House*, took a long lease of it from the Capel family about the year 1730, and began to form the pleasure-grounds, containing about 170 acres. They were completed by his widow, Augusta, Princess Dowager of Wales, who delighted in superintending the improvements, then conducted upon a most extensive scale. At this time Sir W. Chambers was employed in decorating the Gardens of Kew with temples, &c., an account of which he published in a large folio work with many plates, (dedicated to the Princess Dowager of Wales,) under the title of "Plans, Elevations, Sections, and Perspective Views of the Gardens and Buildings at Kew, in Surrey, the Seat of H. R. H. the Princess Dowager of Wales."

The Exotic Department of this Garden was commenced by the same Princess, and much favored by the Earl of Bute, about the middle of the eighteenth century. Many of the finest foreign trees were contributed

by Archibald Duke of Argyle (styled by Horace Walpole the Tree-monger), who sent them from his once richly stored garden at Whitton, near Hounslow.

We find that in the year 1759, Mr. W. Aiton, a pupil of the celebrated Philip Miller, of the Chelsea Physic-Garden, was placed in charge of the Botanical Gardens at Kew—a Gentleman no less distinguished by his private virtues than his knowledge of plants, and great skill in cultivating them. His professional abilities quickly procured him the notice of the late Sir Joseph Banks, and a friendship commenced which subsisted between them for life.

About the year 1789 His Majesty George III. purchased Kew House, which was soon afterward pulled down, and its furniture removed to an older mansion, since known by the name of *Kew Palace*, and once the property of Sir Hugh Portman, who is mentioned as "the rich gentleman who was knighted by Queen Elizabeth at Kew." This small but picturesque red brick dwelling, which appears to be of the date of King James, or Charles I., was purchased in 1781 for Queen Charlotte (who died there); and it was long the favorite suburban residence of the Royal Family. Her Majesty evinced much interest in the increase of the collection of plants; and justly does the late Sir James E. Smith, President of the Linnæan Society, bear testimony to the Queen's love of botany, when he says "that the genus *Strelitzia** (so called by Mr. Aiton) stands on the sure basis of botanical knowledge and zeal, few persons having cherished the study of nature more ardently, or cultivated it so deeply, as Her Majesty." Under such auspices, and aided by the enlightened patronage of Sir Joseph Banks, it was only to be expected that the Gardens of Kew should become celebrated all over the world. So early as 1760, the great or old Stove was built by Sir William Chambers. It must have been a remarkable structure for that time, being 114 feet long; the center is 60 feet long, 20 feet wide, and 20 feet high, exclusive of the tan-pit; while the two ends formed dry stoves, each 20 feet long, 18 feet wide, and of the same hight as the middle part.

In 1761 the noble Orangery was erected also by Sir William Chambers. It measures 145 feet in length, its width is 30 feet, and its hight 25 feet. In the same year was added the very elegant Temple of the Sun, as it is called, of the Corinthian order; and some young trees were planted near, which are now grown to be among the most beautiful in the Gardens, particularly an *Oriental Plane* and a *Turkey Oak*. Such had been the increase of plants, that, in the year 1788, a greenhouse was built for Cape plants, 110 feet long; and another for the vegetable productions of New Holland, nearly the same size, was added in 1792. (This latter has been much enlarged and improved under the name of the "Australian House.")

A catalogue of the plants in the Exotic Garden of Kew was published by Dr. Hill in 1768, and a second edition the following year.

A far more elaborate and important work appeared in 3 vols. 8vo, accompanied by some admirable plates, the *Hortus Kewensis* of William Aiton, in 1789, giving an account of the several foreign plants which had been introduced into the English gardens at different times, amounting to 5,600 in number; and so much was it esteemed that the whole impression was sold off within two years. Mr. Aiton did not long survive this publication, for he died in 1793, in the sixty-third year of his age, and lies buried in the churchyard at Kew, near the graves of his distinguished friends, Zoffany, Meyer, and Gainsborough. He was succeeded by his son, W. Townsend Aiton, Esq., who was no less esteemed by King George III. than his father had been, and who, besides conducting the botanical department, and taking charge of the extensive pleasure-grounds, was also employed in the improvement of the other Royal gardens, in all which he displayed great skill and judgment, and an intimate acquaintance with his profession.

The voyage of Captain Cook and Sir Joseph Banks round the world; those of Captain Flinders and Mr. Robert Brown (*Botanicorum Princeps*), and of Mr. Allan Cunningham, to Australia; the expeditions of Bowie and Masson respectively to Brazil and the Cape of Good Hope—all these enriched the Gardens of Kew with the vegetable productions of the southern hemisphere, to an extent unparalleled be-

* The name was given by Sir Joseph Banks and Mr. Aiton, in compliment to the consort of George III. as princess of the house of Mecklenburg Strelitz. Is is a plant worthy to bear so distinguished an appellation; and noble specimens of it may usually be seen in flower in one or other of the stoves during the winter months, especially that species on which the genus was founded, *Strelitzia Regina*, figured at tab. 119. of the *Botanical Magazine*, and which has been justly described as among the most brilliantly colored flowers in nature. The *Strelitzia Augusta* (*Bot. Mag.* tab. 4167-8) is a far more stately plant of the genus, with larger, but very differently colored petals. By the marriage of Her Royal Highness the Princess Augusta of Cambridge with the Hereditary Grand Duke of Mecklenburg Strelitz, this auspicious name is yet preserved in the Royal Family; and the amiable Princess who now bears it has evinced (we have ample opportunities of knowing) a no less lively interest in the improvements carrying on at Kew than did her Royal ancestor in those to which we are alluding.

fore or since; besides which, other collectors were employed abroad during a long period of years in various countries; and the produce of their researches was deposited at Kew. On various occasions, especially during the life of King George III., other houses, stoves and pits were erected, as occasion required; but it must be confessed, that on the demise of that revered monarch and Sir Joseph Banks, whom His Majesty so much delighted to honor, and who died shortly after the King, the establment languished and suffered from want of Royal and scientific encouragement. During the reigns of George IV. and William IV., with the exception of a few plants being transmitted by occasionally employed collectors, and one hot-house being erected by the last-mentioned sovereign, (and it is but right to add that this conservatory is eminently handsome and ornamental), the Botanic Gardens retrograded rather than flourished; and matters must have been much worse. but for the truly parental affection cherished toward it by Mr. Aiton, and the able exertions of his foreman (now the curator), Mr. John Smith. Throughout the country an opinion existed, which soon began to be loudly expressed, that either the Gardens should be entirely abolished or placed upon a very different footing, and rendered available, as a great popular yet scientific establishment, for the advantage of the public.

Government was, happily, ready to respond to this latter feeling, and in 1838, the Lords of Her Majesty's Treasury appointed a committee to inquire into the management, condition, &c., of the Royal Botanic Gardens. The result was, that in May, 1840, a return was made to the House of Commons, in the shape of a report by Dr. Lindley, who, at the desire of the committee, had surveyed the Gardens, in conjunction with two well-known practical gardeners.

Strangers, or persons not well acquainted with the vicinity of Kew, often entertain very incorrect notions of this establishment; nor can such be wondered at, seeing for how long a time it was the private garden of the Royal family, and taking also into account its extensive and highly varied nature. It may be interesting, especially as exhibiting most forcibly the change that has since taken place, to describe in a few words the extent and condition of the grounds at the time of this investigation, namely, in 1840. They then consisted of—

1. *The Ground immediately about the existing Palace of Kew*, which were of small circuit, lying near the river, and consisting mainly of those of the great edifice or Palace, begun by Mr. Wyatt in the reign of His Majesty King George III., and soon afterwards pulled down, and the grounds of the present Palace. The boundary is the river on the north side, the pleasure grounds on the south and west, and the Botanic Garden on the east.

2. *The Botanic Garden proper* which contained at the time in question eleven acres, or thereabouts, of very irregular outline; bounded on the north partly by the gardens of the residences, mainly Crown property which stand on the South side of Kew Green, in part by the Green itself, from which it was separated by a handsome railing, and in part by the gardens of His Majesty the King of Hanover; westward, by the grounds of the Palace above mentioned; eastward by what were then the Royal Kitchen and Forcing-Gardens (now a part of the Botanic Garden); and south by the Pleasure-Ground.

3. *The Royal Kitchen and Forcing-Gardens*, situated between the Botanic Garden and the Richmond road, comprising about fourteen acres. (This portion has been, as just observed, added to the Botanic Garden.)

4. *The Pleasure Ground* or *Arboretum*, comprising 200 acres of wood, shrubbery and lawn, lying to the south of the Botanic Garden, and bounded by the Richmond road and the river. For some years this extensive and beautiful area has been thrown open twice a week during the summer; the public are admitted at three different entrances, and it is very much frequented.

5. South of this, and stretching between the Richmond road and the Thames, almost into the lower part of Richmond, lies *Richmond Old Park*, or the *Old Royal Deer Park*, as it is sometimes called; a noble extent of pasture, comprising about 400 acres, interspersed with many fine trees, and distinguished by the Observatory erected by George III., now liberally granted to the use of the British Association, and where that scientific body is carrying on an interesting series of experiments on terrestrial magnetism.

The report of Dr. Lindley, mentioned above, has reference only to the second of these divisions, namely, the *Royal Botanic Gardens*, which are stated to "include many fine exotic trees and shrubs, a small collection of herbaceous plants, and numerous specimens of grasses." Ten different stoves and greenhouses then existed; most of which have either been condemned and pulled down as unworthy of the Gardens, or so greatly altered as to be no longer recognizable under Dr. Lindley's description. He stated them, and correctly, to be "crowded together without plan or arrangement, all heated by separate fires,

producing a quantity of soot and liable to many inconveniences." They, however, even then, "contained a great variety of rare and valuable tropical plants in good preservation." The Orangery, situated in the Pleasure Grounds, and the Conservatory, or "architectural greenhouse," already mentioned, and erected by King William IV., are not included in the ten stoves and houses which Dr. Lindley condemns.

It resulted from this investigation, that the whole of the Gardens, Pleasure-Grounds and Park was transferred to the department of the Commissioners of her Majesty's Woods and Forests. Mr. Aiton on the eve of the fiftieth anniversary of his holding office, retired from the charge of the Botanic Gardens; and the present Director received instructions from the Board to enter upon his important duties in the spring of the year 1841, and to prepare as speedily as possible, a report of those alterations which were deemed essential for rendering the Gardens useful to the public at home and to our colonies abroad. Many useful suggestions on these heads were offered by Dr. Lindley in the before-mentioned document, especially the following:—"A national garden ought to be the centre, round which all minor establishments of the same nature should be arranged: they should all be under the control of the chief of that garden, acting in concert with him, and through him with one another, reporting constantly their proceedings, explaining their wants, receiving their supplies, and aiding the mother-country in every thing that is useful in the vegetable kingdom. Medicine, commerce, agriculture, horticulture, and many valuable branches of manufacture, would derive much benefit from the adoption of such a system. From a garden of of this kind, government would be able to obtain authentic and official information on points connected with the founding of new colonies: it would afford the plants there required, without its being necessary, as now, to apply to the officers of private establishments for advice and assistance."

Other alterations of a highly important character could not fail in suggesting themselves to the Director, on his becoming intimately acquainted with the minutiæ of the establishment, many of which it were tedious to narrate in this place.

One of the first was to open the Botanic Gardens for the admittance of the public on every week-day, from the hours of one to six o'clock. Not only the Grounds but the Plant-houses are open to visitors; the number of whom, it is needless to say, is very considerable; yet, what is peculiarly gratifying, and contrary to the anticipation of many persons, this privilege has been rarely abused. In the few cases of an opposite line of conduct, the consequent detection (which must be expected where trustworthy men are necessarily dispersed through the Gardens at their various occupations) has proved its own punishment.

Next to the facility and consequent pleasure and instruction to the public, the enlargement of the ground was an important object. The limit of the Garden was not, indeed, exactly defined where it met the precincts of the residence of His Majesty the King of Hanover; but permission was soon obtained to include within the Botanic Garden all the ground immediately about the Conservatory and Orangery, which greatly enhanced the beauty of the view, and added between three and four acres. This augmentation to the limits, however, was from its small extent, rather to be considered ornamental than useful. Application was made by the Chief Commissioner of Woods and Forests to the Queen, for a grant of land from the contiguous Pleasure Ground, which might afford the means of forming a *Pinetum* (or a collection of plants of the Pine tribe) suited to such an establishment, and also of erecting a Palm Stove, or tropical house, equally worthy of the place and the nation. Her Majesty was graciously pleased to assent to this request; and a portion of the Pleasure-Ground, comprising about 47 acres and including a piece of water, was surveyed, and permitted to be enclosed within a light wire fence, which still gives to view the rest of the Pleasure Ground, and adds to the beauty of the Botanic Gardens. which, thus augmented, contained sixty acres.

Again in the winter of 1846–47, orders were received for abolishing the Royal Kitchen and Forcing Gardens of Kew, as such, and incorporating them with the Botanic Grounds, which has already been done, thus adding fifteen more acres to the scientific portion of the grounds (75 acres in all).

But many changes have been effected within the above-mentioned *Botanic Garden* grounds; for, in the same ratio that hardy plants required more space, so did the tender plants need increased accommodation; and plans were accordingly given in for those improvements, by which such a transformation is effected in the aspect of the place, that persons who have not visited Kew Gardens for a few years can scarcely recognize the localities.

The popularity of these beautiful grounds has steadily and rapidly increased. The number of visitors in 1841, was only 9,174; in 1850, it swelled to 180,000.

Editor's Bureau.

Apologetic.

The difficulties we have had to contend with in the issuing of our August number, we need not attempt to make our readers comprehend. Sufficient that the excuse for the lateness of its appearance, is, on the part of its conductors, good and well-founded. The July number is late in reaching our city subscribers, but through no fault of ours. It was issued in good season, and *we thought* duly delivered by the carrier to whom we gave it in charge. We learned, however, that he had inexcusably neglected to deliver the number; omitting also to let us know of his neglect. Consequently, as we relied upon his doing it according to his promise, our subscribers lost their number altogether: the list and route book being all the time in the pocket of the delinquent carrier. We are very sorry for this.

It may be well to say here, that persons failing any time to receive their numbers by the carrier or P. O. will always find them upon the counter of Mr. Derby's Bookstore.

Editorial Correspondence.

HORTICULTURAL NOTES.

Editors Horticultural Review:

For some years I had been in the habit of picking off with the fingers, and with a knife or scraper, and even a small spade, breaking off the half detached old outer bark of my pear trees, particularly of the Harvest pear and a tree of the Fall Bergamot which I brought with me from England. I continued this with an idea that this cleansing process was something analagous to currying the skins of animals. The native trees, the harvest pears, do not seem to be injured by it, though from the general appearance of the old trees I conclude they are not benefited; the Bergamot is seen cracked very thickly all down the main stem and bears the appearance of decline to a considerable extent. I have concluded, both by reasoning and from observation, that the conclusion arrived at in the Report of the Massachusetts Horticultural Society's Committee, printed in the June number of your paper, that it is an injurious and unnatural process, is correct. Dr. J. V. Kirkland, that able writer and most enlightened and careful cultivator, states that in certain localities a few lofty and venerable pear trees, the productions perhaps of the 17th century were still healthy and productive, and among them he names the Summer Harvest pear. I have trees of this kind on my place, one mile back of Newport, Ky. They are still in good health and bear heavy crops of fruit of a very pleasant flavor. They are as Dr. K. says, seedlings, and very hardy, more so, I think, than the worked kinds. Dr. K. states that he considers this pear preferable to the Magdelani or the Bloodgood. I have found them well worth cultivating for market. As I have before remarked, my experience goes to prove that *seedlings* are generally healthy, suckers never last any great length of time. I have, however, suckers from these harvest pears that are twenty years old and very fine trees. All, both young and old, were effected by the general pear blight of 1846, but have long ago recovered from it. Mr. Elliot bears testimony to the hardiness of seedlings, and names the Seckel, a native American.

I find, as all nurserymen know, that the trimming in of the cedar and arbor vitæ and some other evergreens is very advantageous for the strength, fine appearance and compactness of the shrubs, and is a great defense against the weight of snow. Long straggling limbs yield greatly to the weight of snow.

Low headed trees are certainly the best form immediately round the house, and wherever no stock is allowed to range among them, which they never should. This shape is the better for gathering the fruit, better to preserve the stems from the scorching sun, and better for the du-

rability of the tree generally; the appearance is more picturesque and pleasanter.

I have a specimen of the Paulonea Imperialis, measuring four feet four inches round the girdle, it has a round spreading head covered with flowers and buds. It is I presume, the largest specimen in this neighborhood. I consider it a very strikingly fine shade tree; like Catalpa never touched by stock or insects, of most rapid growth, but like the Ailanthus, attaining too large a size for street trees, unless indeed, in a city laid off as extensively as Cleveland, with sidewalks in proportion; but, unlike the male Ailanthus, without any offensive smell when in bloom.

I have lately been struck with the great and showy beauty of the best kinds of double Hollyhocks—their splendid various colors and erect forms exhibit well at some distance, mixed with round-headed plants; or, like dahlias, at the back part of borders; or it may be so managed as for each plant or set of plants to rise by themselves in rotation from a circular bed on a lawn, or they may be planted to form an avenue with evergreens in the back grounds; though this would require, to produce much effect, rather large grounds. The new kind of Poppies are very brilliant, and in a bed almost rival a patch of Tulips. Their borders are painted in great variety. I state these things for the information of inexperienced persons of course.

There are many beautiful trees, plants, shrubs and flowers which are very common in England which I have not observed introduced much, and some very rarely, into this part of our country. I will name some of them; probably the climate, either too great cold or too much heat, is against them. There are many varieties of the Laburnum tree, or Cytisus. The common Broom Laburnum of England is extremely beautiful with its long racemes of yellow clustered flowers. When it blossoms in this country it will be much sought after. I should like to see more of the *Portugal laurel*, *Cerasus lusitanica*, particularly the beautiful white and yellow variegated, in large conservatories. These are entirely different from the common English laurel or *Kalmia*. Then there is the Arbutus, or Strawberry tree, *Ericacea* family, bearing beautiful blossoms and fruit, a little like the strawberry—too tender for the northern and middle States, but would be splendid in a large green house. We want more of the Hollies and the Ivies. There is the Gum Cistus, *C. cyprius* and *C. ladaniferus*, most lovely for a milder climate than ours. The Spanish Broom, *Spartium junceum*; the flowers are large and of deep yellow, they are in terminal racemes. The common Lavender is uncommon. The fragrance of this for lavender water is not much known here. I have seldom met with London Pride and the old English Marigold. Auriculas in their varieties are comparatively scarce. *Rhododendrons* forming splendid ornaments in clumps, on lawns or grass plots, are uncommon. Sweet Bryony on account of its fragrant sweetness, is too little used about houses. The same may be said of Sweet Briar, although common in our woods. Variegated Box is very pretty but scarce here. Clematis of all kinds is rare; it is beautiful for training over lattice work. The Laurustinus, tiburnum *tinus*, is an evergreen bush with lovely white flowers, which are rose colored in the bud, and followed by dark blue berries; a most desirable shrub, but I suppose too tender for the open air here.

The Napoleon Weeping Willow, of slow growth, does not appear to be suitable to our climate around Cincinnati, as I have had three die gradually in succession.

A Plum tree that I planted close to the side of my house has a crop of plums this year, when every other tree that has fruit has been stung by the Curculio. E. J. H.

Summer Hill, near Newport, Ky.

Editorial Remarks.—Our old friend over the river has been an earnest as he was also an early cultivator of plants in this vicinity, and he should have had sufficient opportunity for observation by this time, to learn that many of the plants he names are unsuited to our soil and climate. It is a very natural sentiment to

look back to what pleased us in our native land in the lithesome period of youth, but better practice to endeavor in a new country and under new circumstances, to endeavor to adapt to our uses and pleasure those abundant beauties that surround us on every hand, in our native copses and prairies.

Sweet Corn.

The public has heard much of late, about the new varieties of this delicious esculent. Having been ever a *corn-planter*, and withal an active devourer of the same article, I have nevertheless claimed that none of the varieties were worthy of a place upon the table, except those known as *sweet-corn*. As I was instrumental in diffusing the culture of the Stowell in this region, I was very glad to enjoy an opportunity of testing its properties at the hospitable board of Prof. Mapes, and can join my testimony to the highest praises that have been bestowed upon it as a table viand—like the writer in the "Granite Farmer," quoted below, I had apprehended that with its other good qualities there might be a deficiency of the essential sweetness, but was most agreeably disappointed. Agreeing in our judgment of this variety, I trust to the value of his opinion of the good qualities of the "Old Colony," which I shall hope to verify next summer, for I insist upon it, there is no more delicious vegetable than a freshly plucked and moderately boiled dish of green corn. J. A. W.

"Since sweet corn has been introduced, the yellow Indian corn has for the most part passed out of use as a table corn. Some however prefer it.

"We have cultivated the present season three varieties, *Stowell's Evergreen*, *Darling's Extra Early*, and *Old Colony*. Of Darling's Extra Early we would say that it is a good variety, but not *extra* early at all, at least with us. Planted at the same time with the others it is in eating at the same time. To be sure we have this variety on the table first, because we planted it in our garden two weeks perhaps before the other kind. With us it is simply a good corn.

"We planted Stowell's Evergreen Sweet, as much for curiosity as anything. We wished to see if it would keep green forever. We had formed the opinion that it was *not* a first rate table corn, that it was large and coarse, with not a delicate flavor. But in this we have been happily disappointed. It is a prime table corn; its appearance is handsome, the ears are large with full deep grains. We tried it after having eaten for several meals of Darling's extra early. It was unanimously pronounced the best corn; it was further said, by several who tried it, to be the best sweet corn they had ever eaten; we congratulated ourselves upon the acquisition, and vowed a spot in our garden to it ever after.

"But we had not then tried the Old Colony Sweet. This we tried upon the strength of its being the "sweetest and best table corn ever cultivated," and it has fully borne out that reputation. We gave it a fair trial. It was first cooked with some of the Evergreen Sweet. This latter was eaten first and as it had come to be a favorite corn, it received its due meed of praise. But then the Old Colony came on in its turn, there was an unanimous exclamation of its superiority.

"The test was a fair one and some what extended. No hasty conclusion was formed. Ear after Ear was tried until all at the table were impressed with the fact that the Old Colony led the list. Still the trial has been adjourned from day to day but with no changes in the result.

"As a table corn we give the palm without hesitation to the *Old Colony*. We should try to save from the grinders, which are neither few nor slow, some seed with which we can supply our friends if desired.

"One more word of Stowell's Evergreen Sweet. It has been stated in the Working Farmer that corn of three different seasons' growth has been cooked at one time, and that it was difficult to tell the new from the old.

"As fodder for cattle—for drilling or broadcast sowing for soiling for cattle—we think this corn would prove superior to our common yellow corn It has a very vigorous growth. In the same field with other corn it stands two or three feet the highest. Its leaves are broad and long and abundant. The stalk is tender and sweet."

Cincinnati Horticultural Society.

The meetings of this Society have been kept up through the hot weather; a coterie of choice spirits assemble every Saturday, at their new room in the Mechanic's Institute, to exhibit and compare their Horticultural products and incite each other to greater efforts in the cause. The tables have presented many large and interesting groups of fruits which always furnish topics for conversation. Among the Pears, many new varieties have been brought by C. Pinkenstein, produced upon his imported German trees. Some of these promise well.

The Society have appointed a very energetic Committe of Arrangements, who are making

great efforts to procure a grand Autumnal Exhibition upon the 25th of September, to continue open for two weeks under pavilions, to be erected upon a large lot in the North part of the city.

The following is extracted from the circular that has been issued:

Great efforts will be made by the Committee to produce a display that shall be worthy of the people of the West. We trust that you will freely contribute such articles as you can exhibit.

Free *Competition* is open *to all* who may bring or send their products, and every care will be taken to have the articles fairly exhibited. No entry fee will be demanded on these contributions. All entries should be made before the 23d of September, by application for space to the Chairman of the Committee, S. W. Pomeroy.

All packages from a distance should be directed to R. Buchanan, Cincinnati, and should be sent forward in time to be received and arranged by Monday, September 25th, except cut flowers, which will be received up to 10 o'clock A. M., Tuesday, September 26th.

A liberal Premium List and approved Regulations have been adopted, to which you are referred for further particulars.

The Committee will have discretionary power to make large additions to the schedule.

Admission, Twenty-five Cents.

Concord Grape and Mr. Hovey.

How differently do men see the same facts! In the August *Magazine of Horticulture*, page 360, Article, "Pomological Gossip," Mr. Hovey refers to my acknowledgment of the receipt of the Concord Grape, from my kind friend Mr. Bull. In so doing he unhappily takes occasion to use a jockey's expression, the precise meaning of which I must confess my inability to understand, and as to *staring with both eyes*, I can simply declare the impossibility of the impeachment. Now with Mr. Bull the case has been quite otherwise, when answering my written letter of acknowledgment, he politely insists that the obligation will be wholly toward himself, should I afford his grape an opportunity of showing its qualities in this location. But to return to Mr. Hovey's remarks, and unfair reference to the "superior"—he must be informed that we have exceeded the picture, in size and beauty; nor did our Society award their premium until the variety had been well known and thoroughly tested, and the world were apprized that it was no "secondary thing." Nor was the premium awarded "to make it sell" for the benefit of the producer or dealer, for it was diffused through the country, from the Mississippi river, Eastward, to the Atlantic, and not confined to the hands of one dealer. The fruit is all it has been represented to be. J. A. W.

Great Agricultural and Horticultural Shows for 1854.

The following list has been prepared with great care and is arranged by the calender.

U. S. Pomological, Boston, Sept. 12–16.
Mass. Horticultural, Boston, Sept. 12–16.
Kentucky, Lexington, Sept. 12–16.
Vermont, Brattleboro, Sept 13–15.
Lower Canada, Quebec, Sept. 12–15.
Western Virginia, Wheeling, Sept. 13–15.
Ohio, Newark, Sept. 19–22.
Ky. Horticultural, Louisville, Sept. 19–20.
Michigan, Detroit, Sept. 25–29.
Cincinnati Horticultural, Cin., Sept. 25–two weeks.
North-western Fruit-Growers, Burlington, Iowa, Sept. 26–29.
Upper Canada, London, Sept. 26–29.
Pennsylvania, Philadelphia, Sept. 27–29.
Illinois, Springfield, Oct. 3–6.
Missouri, Boonville, Oct. 2–6.
Maryland, Baltimore, Oct. 3–6.
New York, New-York City, Oct. 3–6.
Indiana, Madison, Oct. 4–7.
Wisconsin, Watertown, Oct. 4–7.
New Hampshire, ———, Oct. 3–6.
Connecticut, New Haven, Oct. 10–13.
North Carolina, Raleigh, Oct. 17–20.
Georgia, Augusta, Oct. 23–26.
Iowa, Fairfield, Oct. 25—.
National Cattle Show, Springfield, Ohio, Oct. 25–27.

The Pennsylvania Horticultural Society exceeds all others in the extent of its monthly Exhibitions, which are reported as being very fine notwithstanding the damage sustained by the destruction of their Hall by fire. There will be no distinct Autumnal Exhibition this year, but the horticulturists are to unite with the State Agricultural Society in a grand Show at Powelton, on the West bank of the Schuylkill, September 26–29.

TRANSACTIONS.

Kentucky Horticultural Society.

The Kentucky Horticultural Society has continued its meetings during the summer; notwithstanding the drowth, the fruits have been fine though ripening out of season. Flowers have suffered from the want of moisture.

The great Fall Show will be held on the 19th and 20th of September.

The following list of Peaches is presented as guide for planting.

The best varieties in each week are in Roman letters; interior ones ripening with them in *italics*. Date as in year 1850.

July 13—1st week—White Nutmeg.

July 20—2d week—Yellow Nutmeg, as yet no good fruits.

July 27—3d week—Early York, Early Anne.

Aug. 3—4th week—Early Crawford, Early Tillotson, *President, Walter's Early, Grosse Mignonne.*

Aug. 10—5th week—Pope's Cling, Vanzant's Superb, Yellow Alberge, *Cole's Red, Haines' Early Red, Washington Red, Davis' Early.*

Aug. 17—6th week—Hill's, Rodman's Cling, Malta, Hill's Jersey, *Royal George (or Teton de Venus of some,) Davis' Cling, Jacques' Rare Rips, Late Newington, Spanish Cling, Williamson's Cling.*

Aug. 24—7th week—Leopold, Catharine, Crawford's Late Orange, Free Red, Pine Apple (or Grosse Mignonne of some,) Lemon Cling, *Grosse Admirable Jaune, Large Melacaton, Green Catharine, Lemon Free. Old Mixon Cling, Breckenridge Cling,* and many others—(glut of peach season.)

Aug. 31—8th week—Red Rare Ripe (not large, but one of the best fruits for cream or the dessert.) Red Cheek Melacaton, Pavie Pompone, *Young's Seedling, Hike's Seedling.*

Sept. 3—9th week—At this period there is a defect in the present list of succession and peaches are scarce for some two weeks.

Sept. 10—10th week—Grand Admirable, Columbia, Whitehead's Red Heath, and Smock's Late Free.

Sept. 17—11th week—The weather is now cooler and the same varieties last several weeks, ripening slowly.

Sept. 24—12th week—Columbia, Lagrange, Large Heath, Freestone Heath.

Oct. 1—13th week—Ford's Late Yellow, White's Favorite. These are the latest well-flavored peaches of the season.

N. B; The author of this list is aware that Troth's Early, Druid Hill, "Stump of the World," and a few other new varieties have not been fruited here, and are not therefore classified; with this exception, the list is believed to be reliable.

Massachusetts Horticultural Society.

This ancient and honorable Association has been blamed for lending their name, by the award of premiums, to the support and introduction of fruits that were considered unworthy of such commendation, or, if most excellent, it was charged that there was some irregularity in the action of the Fruit Committee. An investigation was therefore instituted and on the 27th of May the following Report was adopted:

"The select Committee appointed by this Society to examine into all the circumstances attending the award to Messrs. Hovey & Co., of a Gold Medal for a seedling cherry and a gratuity of $20 for a seedling pear, report the following facts:—

"That at the last meeting of the Society (in 1853) previous to the incoming of the newly elected Officers and Committees, the Chairman of the Fruit Committee presented a draft of his report; which was re-committed to him for completion. That in the draft of report, as submitted, no mention was made of any award of medal or gratuity to Hovey & Co.: nor up to that time—the last day of their existence—had the question of such awards been discussed in committee.

"That after the adjournment of the Society on the day above-mentioned, and after the departure of the Chairman of the Fruit Committee, C. M. Hovey called together three members of the Committee (which consists of seven members) and urged upon them, very strenuously, the merits of the seedling cherry, which he claims to have originated, and of the pear, which he claims to have introduced. That two of the three members were, of opinion, that the cherry had not been exhibited for 5 years, as required by the rules of the Society. This position was controverted by Mr. Hovey; who also contended that his seedling was conceded to be the best that had been exhibited.

"Your Committee understand, that, when the matter was pressed to a vote, one member (of those present) declined to vote, one other voted for the award of a medal with the proviso that it should be proved to have been exhibited for five years, and the other member voted for the award without conditions. The vote upon the pear was about the same.

"The Committee are further informed that the first intimation received by some members of the Fruit Committee, that such awards were even contemplated, was obtained from the printed Transactions of the Society.

"In the opinion of your Committee, this conduct on the part of a competitor for the highest premiums of the Society ought not to pass unrebuked. Not only is it subversive of all order and good government, that committees should be called together without proper authority; but the offence is magnified, when the person usurping the power of chairman is himself the claimant before the committee,—a party to a suit, before judges whom he may select for himself, and the ex-parte advocate of his own interests. The Society is wronged, because their rules are trampled upon:—the Committee is wronged, because they are deprived of the benefit of a full discussion and of time for consultation; the unnotified members

are wronged, because they are allowed no voice in the decision; the members present are wronged, because they are subjected to the personal solicitations and persistent pleadings of the applicant; other competitors for the premiums are wronged, for their claims are pushed aside; the public is wronged, because it accepts as the well-considered action of the Society, what is, in truth, but the opinions of one or two members, hastily convened, and hurried to a decision by the party most interested.

"If this instance of irregularity, which has been brought to the notice of the Society, is suffered to pass without censure, your Committee believe that the public will regard, with diminished confidence, the decisions of the Society:—for they will, with reason, suspect that our medals and gratuities for new varieties of fruit, flowers and vegetables, are indices rather of the adroit management of the applicants, than of merit in the articles. The number of Exhibitors at our shows and of competitors for premiums will be sensibly diminished; for modest merit will have no chance against unscrupulous assurance. Already complaints "not loud, but deep," have been heard, that rules, which are stringently enforced against some members, are broken with impunity by others.

"In view of the facts above stated your Committee present the following resolutions for your adoption.

"*Resolved*. That the conduct of C. M. Hovey, a member of this Society, in procuring the award to Hovey & Co., of a Gold Medal for a Seedling Cherry, and of a gratuity of $20, for a Seedling Pear was irregular and improper, and is censured by this Society.

Resolved. That a Committee of three be appointed by nomination, to examine and report, what, if any, alterations are needed in our Constitution, or By-Laws, to prevent a repetition of such a transaction. Signed

WILLIAM S. KING.
SAMUEL WALKER.

Adjourned to June 3d, at 11 o'clock, A. M."

The great Autumnal Exhibition of this Society will be held under tents upon Boston Common, on the 13th September; and the Exhibition of the Fruits of the Pomological Society will be made at the same time and place.

American Wine Growers' Association.

The American Wine Growers' Association met at the vineyard of Mr. Werk, on Saturday, July 29, Mr. Rehfuss presiding. The minutes of the previous meeting having been read and approved, notice was given that the trial of the new wines would be held at the house of the Secretary, on the 19th of August; the postponement was ordered in consequence of the late fermentation of wines, rendering them turbid and unfit for exhibition. The samples offered will be taken from a cask of thirty gallons or more, and presented to the President, L. Rehfuss, or to the Secretary, J. A. Warder, on or before the 18th.

A very interesting letter was read from N. W. Thatcher, Esq, of Chillicothe, explaining the manner in which he had made the wine presented in his name by R. Buchanan, Esq., at the meeting:

ROBERT BUCHANAN, ESQ.,

Dear Sir: I am in receipt of your obliging favor of 27th instant. I thank you for your attention in presenting the sample of wine, and I should likewise express my thanks to the Wine Growers' Association for their courteous reception and notice of it. I am not surprised that it was pronounced "strong," for it certainly has great body; but I am at a loss to understand whether "strong" is a term of quality in use by the "Association," to denote some particular degree of strength, or used on the occasion as an implication to the natural strength of the wine.

I reiterate that it is the pure juice of the grape, and that it is not one kind of grape, neither is it a mixed wine, but different kinds of grapes put together before expression. The great desideratum in wine-growing is, doubtless, to procure a grape possessing at once sugar in abundance and an agreeable aroma—probably the Catawba (there are some spurious varieties of this grape,) possesses these qualities to a more profitable degree than any grape we now cultivate, inasmuch as it is perfectly hardy; but this grape should not be regarded as the type of American grapes, for we shall yet surpass it, and to those whose palates do not accord too much with the foxy aroma of the Catawba, the Herbemont is the most acceptable grape; but the latter is not sufficiently hardy for extensive and profitable cultivation; but as we have several varieties of that class of grapes, we may look for the production of seedlings from them that will surpass any of the fox family. doubtless a cross of the Herbemont and Catawba would produce a valuable grape as to flavor and juiciness.

It is, doubtless, a desideratum to obtain a grape possessing all the requisites for good wine; that is, it should be productive, hardy, juicy, sweet, and well flavored. Until we can get one grape possessing in a sufficient degree all these, we can cultivate several varieties and attain our object by mixing the berries in the mash tub. This is desirable, at least, to afford variety in our wines, as well as give flavor to strong-bodied wines which are without it.

The wine sent you was made of 75 per cent. of the Herbemont grape, 20 per cent. of the Catawba, and 5 per cent. of the Constantia, (Schuylkill.) The Herbemont was not fully ripe when gathered, but were picked ten days before pressing. The Catawba were quite ripe, and gathered some days before pressing. The Constantia were fully ripe, and gathered just before mashing. By fully ripe, I mean "dead ripe," the stems brown and dry; and that is the grand point in wine-making. The grapes were picked from the bunches and put together before mashing, and stood twelve hours before pressing, and no extraneous substance of any

kind was added, nor has any addition since been made of any substance whatever. The wine, after coming from the press, was fermented in glass.

The taste of the juice of the grape, as for various kinds of food, becomes fixed to some particular sorts of custom, and finally to the exclusion of anything new: and hence I infer it will be difficult, after a few years, to eradicate the predilection of Ohio wine—even for the foxy aroma of their Catawba wines. If we look forward to the exportation of wines to other countries, we must look for the production in grapes of the Herbemont type. I am a winegrower to a very limited extent, and only as an amateur; but still my experiments are, so far as they are successful, as valuable in their results as if I crushed the grape of a township. I shall make no wine this season.

I am satisfied that we can make as good wines in this country as in any other, and at equal price. I would prefer the best Cincinnati wines to any foreign I have ever seen; except perhaps, the pure Xeres Sherry and Mansanella, which we rarely see.

I am, dear sir, your most obedient servant,

N. W. THATCHER.

On motion, the thanks of the Association were tendered to Mr. Thatcher, with an invitation to attend our next meeting.

REPORT OF THE WINE COMMITTEE.

The Committee, through J. T. Foote, reported the result of the examination of wines, as follow:

To L. Rehfuss, President of the American Wine-Growers' Association,

The meeting of the Committee for the performance of the duty assigned them, was held, on Saturday, the 19th instant, at the house of Mr. A. W. Frank. Thirty-eight samples of wine, distinguished by a number on each bottle, were offered for competition, and a sealed paper, containing the names of the proprietors of the different samples, was deposited with the Secretary, and not opened until the award of the premiums had been made.

The Committee, in making their examination, divided the samples into parcels of five, from each of which the two best specimens were chosen, and from these, after a second examination, the specimens adjudged to be entitled to the premiums, were selected.

In forming their judgment, the Committee paid special attention to the aroma (bouquet)—that delicate and very sensitive quality which constitutes one of the excellencies of the still wines of this region. The slightest inattention to neatness and to the exclusion of the defective grapes, or of any foreign substance whatever in the manufacture of the wine, will have an unfavorable influence on this important characteristic. Even the addition of sugar, in small quantities, at the most, for the purpose of increasing the strength, should be avoided, since its unfavorable influence on the aroma injures the quality of the wine more than the increased strength can atone for—delicacy of flavor, and not strength, being the quality most desirable in our wines.

The taste for wines which, in this country, was originally formed almost exclusively on the coarse, strong, alcoholic wines of Madeira, Spain, and Portugal, is beginning to improve, and it is an important duty of this Association to speed the progress of this improvement, until the pure, light, delicate, and wholesome wines of our own country—with that of France and Germany—shall exclude entirely the intoxicating wines, and liquors, bearing their names of domestic manufacture, and the remembrance of their use and influence be among the mournful memories of past misfortunes and errors. The cultivation of a refined and discriminating taste in wines, and providing such wines as satisfy such tastes, will give a support to the cause of temperance which neither compulsory laws nor voluntary associations can yield; for intemperance, like other crimes, cannot be exterminated by laws, but must be subdued by correcting the tastes, and increasing the knowledge of mankind, so that they may know the good and prefer it to the evil.

It is a duty of this and all similar associations, to continue their requirements of all the makers of wines within their influence, that no foreign substance of any kind should be permitted to mingle with the juice of the grape, and that perfect purity should be with them *sine qua non*. By a proper attention to their duties, they may assist in checking the conversion of many million bushels of the cereal grains into a material for brutalizing and demonizing, instead of nourishing and sustaining their fellow citizens; and by inspiring good taste in one department, correct bad habits in many.

The specimens referred to in this report were—with the exception of two, which were supposed to have had sugar added to the must, and two injured by decayed fruit or some other mark of inattention—of very superior quality, and indicated that the progress of Young America is marked and remarkable in this department of its products as in most others.

Several of the specimens, besides those to which premiums were awarded, were deserving of premiums, and the Committee regretted that it was not in their power to award them. Their judgment was given in favor of No. 34 as the best, No. 24 as second, and No. 13 as third best, and, on opening the seal list, it was found that

No. 34 belonged to G. and P. Bogen;
No. 4 belonged to Frederick Zinzback;
No. 13 belonged to H. H. Duhme.

Respectfully submitted,

JNO P. FOOTE, — STANISLAUS,
S. MOSHER, JNO. G. ANTHONY,
JULIUS BRACE, M. KELLY,

Committee.

The remaining premiums for "other wines" and for Sparkling, were ordered to be awarded at the next regular meeting, September 23, when the Society will meet at the house of L. Rehfuss.

Solar Heat.—No. 5.

ACCLIMATION.

MOISTURE is so intimately concerned with heat in the elaboration and development of the fruitful organs, the degree of each being increased by the absence of the other, and diminished by its presence, that it is absolutely necessary to notice the reciprocal operation of both these agents in the present place. We shall not attempt to investigate the different members of flowers, or the manner in which they are formed, but merely state the conditions most favorable to their production. On the former point, physiologists promulgate such extremely diverse hypotheses, that the unsophisticated inquirer after truth feels himself strangely confounded and perplexed by perusing the works of antagonist authors.

That flowers are distinct organs, fulfilling definite and necessary offices, appears indisputable. Like all other parts of a plant, they are, however, subject to remarkable changes, according to particular circumstances, and their development is also determined by atmospheric conditions. It is by neglecting to consider, compare, and associate these very palpable positions, or by regarding either of them too exclusively, to the virtual suppression of the other, that the differences of physiological writers on this question have been occasioned.

Growth, and the production of seminal organs, are obviously different processes, and require individually the application of particular agents, or, more strictly speaking, a special comparative amount of agency, to render them of a proper character.

Without reference to the actual degree requisite for any species, we may state generally that heat, and a copious supply of moisture, will induce a vigorous growth; while a considerably greater relative proportion of heat is necessary for promoting floral developments. It is upon this point that practical men have generally become confused, and have stumbled. Being unable to account for the non-development of flowers in otherwise favorable seasons, they have assumed that a period of repose is necessary to consummate and elaborate the embryo fructiferous organs in the year antecedent to that in which they are evolved; the facts of the case being that either the temperature was too low, or moisture too abundant, to admit of maturation being fully performed. A very luxuriant growth is adverse to the protrusion of flowers, solely because the supply of nutrimental fluids, is, in such instances invariably greater, in proportion, than the degree of heat which attends it. For this reason, the summer immediately succeeding a warm and rather dry one, is always characterized by a fine display of flowers, and an abundant crop of fruit. On the other hand, cold and moist, or even warm and wet seasons, are as certainly and uniformly followed by partial barrenness; because the nucleus for the ensuing year is not sufficiently perfected for the exercise of the fructiferous functions.

In support of the statements we have advanced, several facts, of frequent occurrence, may be adduced. It is an exceedingly common practice, in the cultivation of fruit trees, when their growth is too exuberant, to deprive them of a portion of their roots. This is done professedly with the object of checking their luxuriance, and rendering them more stunted; the latter state being considered most fruitful. The good consequences resulting from such treatment consist in the imbibition of much less moisture, and a contracted, but especially a *more mature* development; since an equal intensity of solar influence is exerted on the restricted as on the abundant accretions. On the same principle, annual plants, and nearly all kinds of fruit-bearing trees, are subjected to the process of transplantation. The loss of roots which inevitably accompanies this operation, by suspending, or considerably reducing the absorption of moisture, ensures such an extreme elaboration and induration of what sap is imbibed, that flowers, seeds, or fruits

are ultimately produced more speedily, and in much greater liberality.

The experienced cultivator of exotic plants will likewise be familiar with many instances in which all attempts to flower them have proved futile, until he has adopted the course of withholding water. We refer principally to such as are grown in a lower temperature than they naturally enjoy; as a greater degree of heat is in all cases equivalent to the application of a less quantity of water; and, therefore, this peculiar management is unnecessary if sufficient heat be present. Those exotics which are grown in the open air of this country, frequently remain for many years without flowering; and this period is always more prolonged in proportion to the higher temperature of their native climes. Still more rarely do plants from such regions ripen their seeds or fruit: the flowers, when they do appear, generally being abortive. This is unquestionably owing to the want of a due degree of heat to evaporate their unnecessary inhalations, and mature their young shoots. The judicious culturist will, however, in some measure, supply this lack of temperature, by modifying and diminishing the communication of moisture. If only a sufficient quantity of water is administered, or allowed to be received, to enable them, with the existing degree of temperature, to harden and partially dessicate their annual growth, there will never be any scarcity of flowers after they have attained a proper age and size. Flowers and fruits appear to be not only the means which Nature has provided for maintaining and increasing the species, but, by assisting materially in abstracting the aqueous fluids of perennial plants, they prepare them for resuming a similar office in the next season.

This is clearly proved by the circumstance of exotic plants continuing to blossom annually after they have once been induced so to do, provided external conditions remain suitable. An extraordinary profusion of flowers may, and does, by engrossing too large a quantity of sap, diminish fertility in the subsequent year; an insufficiency of pulp leaving the young shoots in a similar state to that caused by a superabundance of fluids—immaturity. But this extreme degree of exhaustion operates very transiently, as the plant becomes equally prolific after the lapse of another season, if auspicious for the particular kind of maturation required.

Reasoning from similar premises, it is highly probable that seeds, especially those of annuals, will vegetate and fulfil the cycle of their destined offices much sooner, with greater certainty, and with less superfluous development of leaves and branches, if obtained from the plants which yield a great number of seeds, and from which, consequently, they are sparingly supplied with fluids; than from such as grow rankly and luxuriantly, at the expense of flowers and seed. Independently of its being an axiom in vegetable physiology, that the peculiar characteristics of a plant are transmitted to its progeny, there are cogent reasons, derivable from analogy, why this supposition should prove well founded; one of the chief of which is, that seeds, when, by keeping, they lose part of their constituent moisture, are rendered more immediately and profusely productive. If, therefore, as in the case above cited, this dessication can be performed naturally, while the seeds are attached to their parent plant, it follows that the consequence will be in all respects similar, and yet more satisfactory. The question is certainly deserving of the strictest investigation. The facts submitted justify the inference that before any flowers or fruit can be produced,—at least, any quantity of them,—the plant must undergo a complete process of evaporation, whereby its aqueous fluids will be evolved, and its vital substance matured; but whether it is from its inability at that period to produce real shoots, or contrariwise, by the concentration and consummation of its mechanism to effect this greatest of vegetable efforts, we cannot take upon ourselves to determine. Due maturation, such as the vigorous stimulation of heat, with only so small a supply of moisture as is sufficient to carry on the economy of the system, will induce, is undoubtedly the main process necessary for the extension

of reproductive organs. To suppose this a result of repose, (as some recent authors have done,) is to ascribe the consequences of the exertion of an active agent, to the quiescence of an inert condition. Many practical directions might be based upon the position we have thus been attempting to establish; a few of the most prominent of which we will here indulge in. It is scarcely needful to apply them to the common ornaments of the flower-garden and pleasure grounds, since these are chiefly such as require no artificial treatment to render their flowers more profuse. Our remarks will, therefore, be wholly confined to the more tender kinds of exotic plants. In the naturalization of ornamental plants from warmer climates, one of the principal difficulties to be surmounted is, the bringing them to a productive state. Being planted in the open ground, the atmospheric elements cannot possibly be adjusted to them in the necessary manner and degree; other measures must, therefore, be adopted, which will, as nearly as practicable, answer the same purpose. As the class of plants susceptible of acclimation in this country comprises species which, upon the aggregate, are found in exposed situations, one of the chief designs of the cultivator should be to choose a spot for planting them where they can receive the full advantage of air and solar influence, and yet be partially or seasonably sheltered from cold winds. A position where the action of the sun during summer would be sufficiently strong to ripen the growth of that year, even though artificial protection should be requisite in the same situation in winter, is far preferable to one in which the shelter is permanent, because naturally afforded, and creating shade likewise.

Where the heat, under prevailing climatic circumstances, is not intense enough to occasion a proper and perfect maturation, attention must be directed to the diminution of the sources of fluid sustenance, by remitting its application, or checking its imbibition. This latter may be effected in two different ways. A temporary covering to the soil around and above the roots during heavy or long continued rains; or a reduction of the number of absorbent spongioles on the roots, according to the vigor of the plant, and the amount of deficiency in solar supplies, will both fulfil similar ends; and either, or both, of these methods may be practiced when necessary. That last named is, however, the most efficient, and can more easily be executed. It is somewhat singular that one or the other of the above systems has not been extensively acted upon in the management of plants of the description now under discussion, where flowers are desired. Their beneficial tendency cannot be doubted: particularly as the means thus employed to facilitate the expansion of the floriferous organs, are precisely those which would assist in rendering the plants impervious to frost; ripe and indurated wood, and the almost total absence of juices, being a state in which frost can inflict but little injury. Greenhouse or stove exotics, or such as are cultivated in pots in any situation, are far more fully beneath the gardener's surveillance, and can more readily be stimulated or restrained in the exercise of their functions, by modifying the conditions of the atmosphere in which they live. Plants which are required to flower freely, are never placed in pots of too large a size, and are watered with the utmost caution. This treatment produces the same effects as the reduction of the roots of those which are in the open ground. In both cases, the amount of moisture received is lessened, and a lower degree of heat is competent to perform nearly the same service as an adequate temperature would under ordinary circumstances; saving, of course, that the accretions are circumscribed in extent, which is of no real importance. Orchidaceous plants are universally presumed to derive advantage from a few months' repose from active growth; but it may be safely affirmed that it is not rest itself which elicits their dormant disposition to flower, this latter function being made palpable solely by the dessicating influence of heat. The proper nature of this repose is, therefore, evidently a degree of aridity proportionate to the rate of temperature. Where no artificial heat is employed, water may be

entirely suspended; and never should there be more supplied than will suffice to preserve life. Assuming this opinion to be correct, the natural inference is, that what is called a season of rest, should be termed a period of drought or maturation. It seems ridiculous to suppose that actual dormancy can be in any way useful; for this condition can only be beneficial, when so modified that heat may predominate over moisture. And if these two agents were adapted to each other throughout the growing season, maturation would be completed ere the commencement of cold weather, and the plants might then remain in a cool, dry house, and be perfectly torpid, during the winter.

With respect to very young exotic plants, of all kinds, it is plain that their treatment should be essentially different from that pursued toward plants which are wished to flower profusely. So far from endeavoring to restrain their growth, every means, consistent with health, should be resorted to, which can in any way facilitate it. Precocious developments are, however, greatly to be deprecated; and (orchidaceous plants excepted) stimulation must not be extended beyond the natural period. By potting them frequently into larger pots, liberally bestowing water, and judiciously increasing the *natural* heat *in summer* by artificial aids, they may be much more rapidly prepared for a state of vigorous production, and beautiful display than is ordinarily the case. After the attainment of this epoch, the policy we have before recommended may be commenced and followed.

When plants have flowered very abundantly, and there is any probability of their relapsing into a state of sterility in the following year, this consequence may be partly averted by the administration of a large portion of nutrimental liquid food, accompanied by a greater ratio of heat, immediately upon the fading of the flowers. Tropical, or other *very tender* species, that are not disposed to flower freely, should never be allowed to bear seed, unless they grow too luxuriantly, or this is indispensable for their propagation; as such a process has a most debilitating effect, and one which *sickly* plants of this kind are unable to endure without injury, on account of their being so unnaturally circumstanced. The results of many experiments, casually obtained, render it, in our opinion, extremely likely that the capacity of plants for withstanding cold, varies exceedingly according to the temperature of the climate in which the seeds from which they are raised were ripened. This hypothesis, however vague it may seem, is certainly a rational one, and is confirmed by analogy, as well as by the experience of many intelligent cultivators. It is, doubtless, generally known that plants growing in elevated or exposed sites are more hardy and far more capable of bearing with impunity a transference to a colder country, than those which are luxuriating in every species of atmospheric condition most congenial to their habits. Nor, we imagine, are any ignorant, that the longer those of the former class remain in such positions, the more hardihood they acquire. The normal organization of the germ being constituted under certain circumstances, it is, by one of the wise laws of natnre, adapted for development beneath similar circumstances. These facts tend greatly to the establishment of the theory in question; since, if individual plants thus differ, the seeds of the hardier specimens must partake of the character of the parent. When germinated, the young plants produced from them will, from that incident, have a yet more robust habitude than their progenitors originally possessed; and, by consequence, will be fitted for more extensive alterations in their capacities, and the endurance of greater climatic rigors.

Within our own knowledge, plants that were once confined to the greenhouse, or even to the stove, have been made to adorn the flower garden during the summer months: and, in some instances, have also, with a trifling protection, stood through the winter in the open air. Some may attribute this to the well known fact, that scarce and valuable plants are almost invariably kept in too high a temperature on their first reception in this country, and

from thence argue, that they would have been equally hardy at *that* period, had their capabilities of sustaining cold been thoroughly and properly tested. But while we grant qualifiedly the truth and force of this train of reasoning, we cannot coincide in it to the extent it is here carried. There appears to us no doubt that such ability to endure the changes of our clime is due to the circumstance of many of the plants alluded to having been raised from seed ripened in Britain. In every instance, the habits have indisputably been modified, as may be seen by importing and exposing specimens of the same species, which would inevitably be destroyed. Were the correctness of this theory fully demonstrated,—and we venture to predict that it only needs due investigation to place it beyond dispute,—it would afford most valuable assistance to the cultivator in his endeavors to acclimatize exotic plants. We recommend all individuals of this class to institute immediately a course of experiments with this definite object in view; and however gradual and protracted may be the process by which a plant is thus brought to accommodate itself to our flower-border, if it should ultimately succeed, an inestimable advantage will be gained, and it is impossible to say to what extent the practice may eventually be carried. Collectors should also have this in constant remembrance in their searches; and, when their object is to obtain plants adapted to the climate of the countries for which they are traveling, they should endeavor to procure the seeds from those localities, the temperature of which accords most nearly with that of their own clime. There is another office performed by heat in maturing fruit, to which it may be well briefly to allude. It has already been asserted to be the prime cause of fertility; but, with pulpy and edible fruits, it is also the main agent in rendering them palatable and agreeable. All saccharine matter is generated by the action of heat, as is proved by the acidity of those fruits which are produced in cold summers, or are insufficiently ripened. It may be assumed, likewise, that though sugar is so abundantly manufactured from the beet root in France, a remunerative, or at least an equal, return could not be realized in England, even though the price of land and labor were assimilated.

Could we have entertained a well-grounded opinion that popular desires are always guided by permanent advantage, and directed toward the emolument of science, we might have felt ourselves justified in multiplying these papers to an almost indefinite extent; so comprehensive and transcendantly important is the subject of of which they treat. But, impressed with the conviction that, to the majority of our readers they must now be growing tedious; and in accordance with the saying of one possessing deep penetration and knowledge of human nature, that "variety's the spice of life;" for we believe that this applies with no less force to literary and scientific recreation, than to the meaner occurrences and engagements of general society: we shall speedily close this series, by portraying some of the most striking effects on vegetation of the varied climate attendant on different zones, altitudes, and other circumstances which influence the temperature of a locality. On a mountain of sufficient size and height within the tropics, the whole of the vegetable species inhabiting our globe might have assigned to them a climate whose temperature would be exactly such as they naturally experience in their respective degrees of latitude; these embracing all that man has yet been able to explore. However startling this assumption may appear, it is confirmed by indubitable facts. The proofs of its verity are profusely furnished by Nature's great Architect, since, on the most insignificant hills, many plants that would flourish in the valleys can scarcely be preserved; while, on the summits of the former, other plants are found, which, still farther north, seek a lower and more retired position. Cases are by no means rare, even in Britain, where, in ascending a hilly range, or isolated mountain, the limits of distinct groups of native vegetation may be discovered, each possessing a hardier character than the one beneath it, till we arrive at

the point, beyond which, during the severe months, continual snow performs the part of a protector, and the plants, consequently, are less hardy. Let us, however, as collectors and cultivators of the vegetable productions of all countries, carry our researches beyond this comparatively diminutive, ocean-encircled spot, and contemplate, for instance, that incomparably vaster range of mountains—the enormous Himalayah. Here is a tract, from the study of which great practical assistance and instruction may be obtained. Many thousand feet above the base of these mountains, the ordinary tropical plants are met with in the greatest vigor; while below their summits trees are found which will thrive, without shelter, in the open ground of Britain. The same phenomenon prevails, though to a smaller extent, throughout every elevated region in the world. As the sea, with reference to the earth's centre, is at all points nearly on the same level, it is very properly chosen as a universal standard from which to calculate the height of any eminence; and the higher we ascend above the surface of this immense plain, the greater degree of settled coldness the atmosphere assumes.

Commencing, therefore, with the position that a certain degree of increased elevation is commensurate with an infinitely greater advance toward the polar circles, or that the temperature undergoes a similar, but much more rapid and sensible diminution, we need not stay to expose the inutility of acquaintance with the native country of a plant, while the hight of its actual haunts is unknown; but will at once urge the direct bearing of the question, and strive to show how this apparently lax and broad principle can be brought to regulate common cultivation on soil. It might be imagined that in an island, the face of which is so little diversified, the temperature could not, on the highest of its puny hills, be palpably depressed. Those who yield to this supposition, will, however, by a little observation, find themselves strangely in error. There is not a hill, how limited soever may be the space it occupies, or the hight it attains, which does not affect the condition of the plants growing upon it. In a few instances, this influence is beneficial, and these we shall hereafter enumerate; but, with regard to exotic plants generally, it only tends to augment the cultivator's difficulties, retard the progress of his charge, or facilitate their destruction.

To prevent any unnecessary cavil at the foregoing statement, we will add that it refers solely to an unsheltered hill; where the danger to tender plants would increase in proportion to its hight, on account of the additional cold to which they would be exposed. On very trifling eminences, however, this would perhaps be counteracted by circumstances which will subsequently be noticed. Hills are not necessarily improper situations for the planting of exotic species; nor are the valleys, as might be mistakenly inferred from what we have just declared, always the most appropriate. The suitability of either depends entirely on local considerations, and the nature of their surface. The summits of extensive but not very high hills, which present a considerable and tolerably uniform superfices, may probably be the best sites for half-hardy shrubs; because, in such localities, the desired degree of aridity is usually preserved about the roots, and the thorough exposure to sun and air that is afforded, is exactly such as will give firmness and maturity to every annual development. Imperfect protection from cold, wintry winds, would not in this case be followed by the usual injury; as sufficient natural preparation would be made during the summer to enable the plants to dispense with the greater portion of such assistance.

A position on the sides or slopes of hills, though in some respects eligible, affords much more doubtful security for the maintenance of tender plants unless it be open alone to the south or southwest. In all other aspects, no valuable trees or shrubs can be planted without incurring great risk. The reason of this is perfectly clear. Very little direct light, and much less heat than is supplied to the opposite side, ever reach such spots; while, at the same time, they lie completely open to the most inclement winds which our climate experiences. We may add, also, that, owing to the former of

these causes, (lack of light and heat,) the escape of water is, in cold, wet weather, much impeded, and stagnates about the roots of plants, to their great detriment.

Valleys, to be perfectly adapted for growing exotic plants, must not be circumscribed, especially if traversed by a river or stream. No spot can be less fitted for conducting the more refined part of floriculture, than a narrow valley, through which a river flows. The constant exhalations from water are calculated, not only to saturate the leaves and branches of plants, but, by remaining in the lower stratum of the atmosphere during a frosty night, in many instances occasion all the consequent destruction. All who have had an opportunity of observing the injury sustained by plants in dales from a slight hoar frost, must have noticed, that in those districts which were above the low-lying vapors, similar plants have wholly escaped its effects. This simple circumstance casts much valuable light on the subject of the present article.

Wherever water exists, it has a constant tendency to lower the temperature; and the vicinities of places wherein it abounds most, suffer the greatest reduction of heat. The sea may, however, be considered an exception to this, since its immense and continuous expanse of water retains through the winter a higher temperature than the superincumbent and surrounding air. Plants growing within a few miles of the sea coast, (at least of that portion of it which is not swept by the icy blasts from colder regions,) may therefore be presumed to enjoy an increased degree of heat at that season, on account of the incessant radiation from so large a body. On the other hand, by absorbing more rapidly than land the superior heat of the atmosphere, it materially reduces the temperature in summer, and thus maintains a comparative equability.

With rivers and all smaller channels of water, it is wholly different. The mists which are perpetually arising from them, if confined between two ranges of hills, having no room to disperse, are condensed and precipitated to the earth in cold evenings, and, by their deposition upon plants, affording as it were an attraction to frost, subside into globules of congealed fluid, the mischief occasioned by which is soon exhibited after the first action of the sun. But when the valley occupies a broad district, these vapors, possessing little heat or diffusive power, are dispersed throughout even its most remote parts, and their density, with its concurrent effect upon vegetation, is proportionately lessened.

Having stated thus cursorily the changes in the temperature of a climate which the altitude of a spot or its proximity to water will produce, we will now, lest any misapprehension should arise, add our own deductions and conclusions. All low, marshy places should be particularly avoided, as containing within themselves elements, which, if not counteracted, inevitably cause or lay the foundation of disease and death. We here include those tracts in which any disposition, (although only periodical,) to particular dampness is apparent. Whatever may be the impressions or desires of cultivators, nothing is more certain than that the production of a stunted habit of growth is the surest method of acclimatizing plants. If once the natural luxuriance of any species is attempted, whether immediately or within several years after its being planted, its wood will never be ripened, in a few years it will become weak and sickly, and there is every probability of its ultimate loss, because in such a state it will require greater and more durable protection than can possibly be afforded.

All the bad consequences here specified inevitably attend a too humid situation and soil. A less moist compartment in a wide spreading vale, but effectually sheltered and shaded, either by trees or artificial erections, is equally inappropriate with that to which we have just objected; and from the same as well as additional causes. Beside giving encouragement to excessive moisture, it deprives the plants of a condition which is quite essential to their perfect development. Nearly all half-hardy shrubs flourish beneath a far more rigorous emanation of both light and heat from

solar sources, than we could allow them in our most prominent and most unincumbered districts. By contracting, or in any way infringing this supply, we, of course, and to precisely the same extent, diminish their produce, and prejudicially affect their health.

Notwithstanding, then, the too frequent practice of forming plantations to shelter tender plants, we would press upon all who are desirous of naturalizing the most beautiful of European, Australian, and other exotics, to place them where nothing can impede or subdue the action of any atmospheric elements, rain and its various modifications alone excepted. Permanent shelter of every kind is injudicious, unnecessary, and even hurtful. That effected by plantations of trees is the most common mode; but, as many of these must be deciduous, the plants are most protected at a time when there is not the slightest need for any such interference. And in the winter, if frosts are so severe as to occasion danger, it is as easy to apply artificial shelter according to our proposed system, as it would be in the case of which we have been complaining; nor, all circumstances duly weighed, would there be any greater necessity for it, or for a more abundant application.

While we denounce so unqualifiedly the general method of providing any fixed material for averting cold, we must cautiously guard against the opposite extreme, for reasons heretofore delivered. The top of an extremely elevated piece of ground, unless it be of considerable circuit, and tolerably free from irregularities, would be a highly dangerous spot for cultivating tender species. The upper verge of any declivity, however slight, is equally objectionable. In short, a nearly level, dry, thoroughly exposed plot, of only a moderate altitude, and, if on a plain, at a proper distance from rivers, lakes, or other large bodies of water, will, with regard to temperature and its dependent or concomitant conditions, furnish a situation wherein any kinds of plants may, if any where, be fully acclimatized.

Effects of Winds on Vegetation.

When any great peculiarity distinguishes the weather, so as to exercise an observable influence on vegetable life, it is a maxim worthy the consideration of horticultural writers, that no deferred remarks concerning its phenomena and agency can be of such general benefit to cultivators, as if they were published immediately after its occurrence. Deductions based upon the reminiscences of a remote event, lose nearly all their force on account of the defectiveness of the faculty of memory in many individuals to corroborate and complete them. But those that are placed before the mind while the incidents from which they are drawn are yet brightly imaged on the brain, have the advantage of these recent impressions to establish their propriety, and strengthen their desired operation.

Our present dissertation is the offspring of this reflection. We wish to seize on every thing of moment as it passes, and from it either elaborate or confirm principles of future and permanent value. Looking back through the late month of March, we perceive that what the frosts of December had no power to accomplish, the piercing winds which have followed at a period more generally genial have at length effected; multitudes of common border-plants having been destroyed, while in some places, hardy evergreen shrubs are greatly damaged. If it be recollected that the thermometer ranged much higher on the latter occasion, the injury sustained by plants is, on a superficial view, a curious circumstance; inexplicable, though, from its keeping with prior experience, not surprising to the more practical man; but at once traceable to a fixed law by the more scientific. Winds, though doubtless originally generated by heat, are universally known to be, with few exceptions, the means of abstracting and wafting it away; and, as well in proportion to their violence as to the temperature of the regions through which they have passed, cause a palpable decrement of sensible heat in bodies exposed to their action, this diminution never being indicated by a thermometer in a cor-

responding degree, partly because that instrument is not usually placed in a thoroughly unsheltered situation, but chiefly because the thermometer registers the actual temperature of the air alone, without reference to any further conditions by which the radiation of heat from other substances is facilitated.

Of the tendency of winds to lower the temperature of the human body, all are cognizant; as every person feels the difference between an atmosphere in a secluded spot and that on an exposed eminence at the same period. Proper investigations render it certain that plants are acted upon in this respect similarly to animal beings. All living things engender an internal heat, which, while vitality lasts, will ever maintain them at a temperature relatively superior to the ordinary heat of the air. Hence, as the latter frequently falls below the heat existent in animal and vegetable matters, it must necessarily be continually extracting their caloric at those seasons. When the atmosphere is calm, the radiation of heat from such bodies is comparatively slow, the involving and partially permeating stratum of air being tempered by that already given out, and consequently not abstracting so rapidly the portion retained; whereas, if winds are travelling over, they bear away the volume transpired, and a rapid succession of cold strata demands a much more profuse effusion; the extent of this loss being exactly adequate to the volocity of the breeze, or the quarter from whence it proceeds. But although the preceding account explains the manner in which winds dispose of the heat they abstract, and partially describes the mode of their ministration, we have left untouched that intricate element of their action to which all their effects must be ascribed in the season herein commemorated. We have said that currents of cold air naturally and directly disengage the temperature of bodies which they can penetrate, or around which they have full liberty to play. Let us now add, that their next highest office is the liberation of fluids from terrestrial objects, and that such a release can alone be accomplished by vaporization, in the transaction of which the emission of a considerable portion of caloric is requisite. Fluids and heat have a strong affinity to each other; or rather, no substance can be liquified or retained in that state unless it comprises a certain quantity of heat. The temperature thus resident in a liquid, or a body containing moisture, induces a continual expansion of its watery parts, till at length, driven to the surface, it is there detached and concentrated into the distinct but imperceptible particles that constitute vapor, and then, by its own energy, diffuses itself through the atmosphere, carrying with it much of the inherent caloric, which is now comparatively transmuted to a latent state. The escape of heat in the process of evaporation is far too little understood. As it intimately concerns the enquiry we have here undertaken, a few words may be devoted to its elucidation. It must first be stated that heat has a property of ascension, ascribable to its total want of specific gravity, by which it is always flying off into a more elevated medium. It thus plainly seeks the upper surface of any substance, and in its progress thither, forces with it the more subtile particles of fluid which are interposed between it and the air. By its constant accumulation in these, (which being lightest, are always uppermost,) whether from additional extrinsic applications, or by its more tardy abstraction from interior and lower sources, it finally distends and etherealizes them to such a degree, that they are made capable of floating in the atmosphere without any other support than the heat which they involve. Here, then, is the explication of this phenomenon. Water cannot be rarified into vapor until it has collected into each individual atom of that vapor an amount of heat sufficient to keep it dilated and poised in the atmosphere; when this takes place, it immediately quits the colder portions beneath it, and, both as an essential to its continued imponderosity, and a consequence of its separation, bears with it the element which imported its volatility, leaving the body from which it emanated with a deduction of temperature equal to the share it contains. Those who study

such matters, will not fail to perceive in the above imperfect description, the reason of the extraordinary force of steam. Were an air-tight vacuum to be heated to the highest possible degree, the materials circumscribing it might be consumed, but they would never explode. On the other hand, if a close vessel be partly filled with water, and the water caused to boil, the intense heat accumulated in the vapor would create such an amazing expansion, that the bursting of the vessel would be inevitable, we can hardly deem it needful, after what has been advanced, to mention that evaporation is not invariably a result of the external action of heat. Perhaps the most commonly-received notion of this great natural process is, that it is brought about solely by the active influence of the sun; and this is so far correct, that perspiration is most copious under immediate solar agency. Nevertheless, seeing that drought may be excited by other means, and that the main incentive to evaporation is a dry atmosphere, however it may be produced, we learn that vapor is exhaled either by the concurrent operation of solar and inherent heat, or by the simple effort of the latter to attain a greater altitude.

To assist the reader in appreciating our conclusions, we shall now show how excessively cold winds are injurious to plants, and what are the conditions which increase their prejudicial consequences. Creating a remarkable degree of aridity, they must, in conformity to the doctrines propounded, occasion a proportionate amount of evaporation; and, as in the instance of radiation already analyzed, this being borne to other districts as soon as evolved, there is none of the mitigation which would result from the gradual saturation of a stagnant air, but an incessant and equal efflux is maintained. It will follow, therefore, that when a plant surcharged with moisture, or with its members in the fittest state for exhaling it, is subjected to winds, its exhalations will, *cæteris paribus*, be most abundant, and the reduction of its temperature most seriously extensive. An instant clue is thus obtained to the injury spoken of in the outset of this paper. The unusual quantity of water which fell last autumn, has rendered vegetation so excessively turgid, that when this fluid was drawn off by a process which, while it engendered cold, brought no supply of heat to modify its influence, plants could not be otherwise than reduced to the lowest ebb of vitality, or completely killed. In other words, because chilling winds, and not solar agency were the instruments in relieving vegetation of its unwonted load of moisture, it was deprived of much heat that was absolutely essential to sustain life, and its organization was thus materially disarranged or ruptured. Other conditions unquestionably combined with the foregoing in this work of destruction. The only one we shall point out is the state of excitation which had been induced by a long period of mildness, whereby, in those plants which had not extruded their buds, a determination of fluids to their more porous extremities was effected, and with such as had begun to elongate their parts, the like motion, with a still greater susceptibility of surface, must have taken place. These of course augmented the discharge of both moisture and heat. Let us pass, however, to the application of these facts; for, as in ethics, the bare relation of incidents, even when their collateral causes are rigidly examined, is of little value compared with the motives and guides to subsequent action which may be deduced therefrom. The first inference that meets our view, is that thermometers are only useful in uniformly still states of the atmosphere; for the moment it becomes agitated by winds, human feelings are the best tests of its coldness. In tempestuous weather, therefore, no instrument should be trusted; but protection afforded in the same comparative degree as it is found necessary to maintain our own warmth. Still, to guard against misrepresentation, and check any disposition to make use of this direction without due limitation, it must be added that when the sun is potent enough to reinvigorate the plants on which winds are exerted, everything indicates that they are beneficial. It is merely when the external resources of heat are small, and there is

no natural provision to make good the deficiencies consequent on extensive deprivations, that bad results may be anticipated, or remedies adopted. The remaining deduction we have to make, is one which refers more explicitly to the active management of tender plants. It relates to the desirableness of sheltering them from the hurtful operation of spring gales. In the culture of the choice kinds of fruit trees, such a measure is rarely neglected; and why equally susceptive flowering shrubs should not be similarly provided for, it is difficult to opine. Perhaps it may be said that as the former are obviously grown for their fruit, and as this could not be secured without some protection, policy dictates its employment. So of ornate plants, we may likewise allege that the end of their cultivation being to procure a good display of blossoms, there is not a whit the less necessity for protective tendence at that season: and we are persuaded it will not be grudged by those who deliberately sift these remarks. With the simple assertion that what has here been brought forward has no reference to other than plants in the open ground, the entrance of wind to floricultural erections being effectually barred, and its action on their roots too indirect to merit particular notice, we shall now conclude our observations on these mighty but versatile emissaries of Nature; assured that by vigilantly watching thair effects, we may gain some definite opinion respecting their peculiar powers.—PAXTON'S BOTANICAL MAGAZINE.

GREAT PARISIAN WORLD'S EXHIBITION, 1855.—Mons. Alex. Vattemare, of Paris, so favorably known in this country for his untiring efforts on the subject of International Exchange, authorizes us to say, that he will be most happy to aid any Exhibitors from the United States, who may be desirous of presenting articles at this great Exhibition. From Mons. Vattemare's connection and acquaintance, he will be able to render more valued assistance than any person with whom we have any acquaintance. We shall take great pleasure in facilitating arrangements, through Mons. Vattemare, with any who may desire his services.—B. T. JOHNSON, *in Journal.*

The Radiation and Conduction of Heat.

No meteorological phenomena are so pregnant with interest, or of such pre-eminent import, to the gardener, as the transit of heat from one substance to another, and from terrestrial bodies to the atmosphere. And yet, speaking generally, there is scarcely a cultivator who could clearly explain their nature, or definitely state how they are accomplished. Many most ridiculous notions concerning them are rife in the world of horticulture, a few of which have even been supposed to have received confirmation from professedly scientific sources; so that it is incumbent on some one to place the subject in so simple a light that no further mistakes may be justifiable. This task we propose now to attempt. Philosophers have long since determined that changes of temperature, in common with all other procedures of Nature, are regulated by certain unvarying laws. Of these, one of the most prominent is, the transition of heat from a warm body to any cold one which may be contiguous, till the temperature is equalized. Now, although air is too seldom regarded as a refined and subtile substance, such is its unquestionable nature. Hence the process termed radiation is, in point of fact, though to a limited extent, a kind of *conduction;* the small particles of matter of which the atmosphere is composed being the media through which, when brought into contact with objects on the earth's surface, their heat is abstracted. The above position does not however wholly hold good; since heat is said to be capable of pervading a vacuum, and matter cannot consequently be a necessary auxiliary to its dispersion. For all practical purposes, therefore, and likewise to facilitate the inculcation of the precepts of science, a very proper distinction is made between radiation and conduction. Both are the result of expansion,—one of the most striking properties of heat; but the former is the means through which the temperature of a body is lowered by diffusing itself into a colder *air,* while the latter term is applied to the passage of heat from a warm *solid* substance

to a cold one, when placed in immediate contact therewith.

Radiation, as the very word implies, is the divergence of a number of heated atoms, in the form of rays, from a body thoroughly warmed; or, as some assert, it is the mere emission of calorific rays, causing a greater or less undulation in the constituents of the atmosphere, whereby an increase of temperature is occasioned. Thus, the sun radiates heat perpetually, some of its rays being transmitted through our air to the earth, by which they are received, and from which, during the abscence of that brilliant luminary, they again emanate in a similar manner. It is very frequently confounded with refraction, which is quite another process, and most markedly different; radiation being the simple issue of heat from any surface, and refraction the interception of its rays by an interposed screen, and their re-radiation from thence towards the point from whence they originally proceeded.

For example, the earth *refracts* many of the rays that reach it from the sun, and it is chiefly from this cause that the geniality of our atmosphere arises. But it also *imbibes* other rays; and the *radiation* of these serves to prevent a coldness during the night that would be wholly destructive both to animal and vegetable life. Having thus laid the basis of the application of artificial coverings to plants on the principles of science, the following hints on protection will not be misapprehended. Plants being formed of earthy and atmospheric elements, combined and concentrated according to their peculiar powers, have, in proportion to their porosity, and with a slight reduction on account of their vital energy, the same tendency to radiation as soil. Unless, then, this be duly interrupted, the more susceptible kinds must be subjected to irremediable injury; whereas, if radiation can be effectually suspended, they will be perfectly safe in the most severe weather. We would most willingly print this last declaration in capitals, if we thought it could escape the culturist's notice; so mightily influential do we deem its purport. It follows from these premises, as we have often before endeavored to show, that the old method of supplying fire heat to plant-houses, where the sole design is to exclude frost, is radically wrong; indeed, it is a positive and total waste, expended, too, on an object that cannot sometimes be realized by such a practice, and the failure of which is more or less likely to be fatal to the plants. If it be demanded what we would substitute for it, we would suggest—*prevent the escape or radiation of heat*, and there will be no need to essay the supply of a deficiency that does not exist. If these hints on radiation have received half the attention which their subject demands, the reader will be ready patiently to pursue the investigation as it concerns conduction. We have distinguished the two processes by showing that the first phrase characterizes the transmission of heat to the superincumbent air, while the topic now to be discussed embraces the deprivation of temperature which a body suffers on being touched by a colder one. On the extent to which the latter circumstance is obviated, the merits of any system of covering plants, whether in houses, frames, or the open ground, must, to a very great degree, be wholly dependent. It is notorious to every enquiring person, that heat is much more speedily dissipated when the substance containing it is in direct connexion with some less highly heated material. But the more humble members of our profession find it difficult to comprehend or believe this fact. Let us, then, adduce an easy illustration. If a bar of cold iron, which, perhaps, is one of the most rapid conductors of heat, be placed within an inch of any individual's hand, the diminution of caloric which its vicinity occasions is scarcely perceptible; but if the same substance be grasped or laid on the hand, the abstraction of heat is so sensibly felt, that without a strong effort of volition, the iron would immediately be dropped. Again, the atmosphere of an apartment may be exceedingly comfortable as regards temperature, and altogether consonant with the appetencies of a sensitive person, while, by pressing the hand against glass of which the outer side is exposed to a severe exter-

nal air, considerable pain will be experienced from the loss of caloric consequent on such an act. We have chosen these commonplace examples the more completely to demonstrate our position; although the experience of the cultivator of extensive practice might at once decide the point. There is the most opposite analogy, in respect to heat between an individual in a confined room, and a plant in a sort of tent like, or any other protective frame. Both may be kept from perishing by frost if situated in the middle of the area, but both must undergo the loss of those parts which are in contact with a thin covering closely communicating with the outer air, if frost be sufficiently severe. Proofs of this have often been furnished in the case of plants whose shoots touched the glass or mats by which they were surrounded.

Herein, therefore, lies the art of protecting plants. They must, first, be enveloped in a material which is known to be an imperfect radiator of heat, so that their own temperature may, for the most part, be retained within or around them. And secondly, that material should be so disposed, that no part of it be nearer than about two or three inches to the exterior shoots. The importance of confining and tying in the outer branches of shrubs that are wished to be covered, will thus be plainly discernible. Plant-houses and frames have yet to be treated of. It is generally imagined that no resemblance is traceable between the operation of sheltering these, and that of protecting isolated plants, because specimens of the former are already guarded by a sheltering surface. The principle, however, remains unaltered and unalterable, whatever may be the conditions in which the plants exist; and is as applicable in the one instance as in the other. Glass it is well known, radiates heat with astonishing rapidity, and the temperature which a glazed surface derives from the house or frame beneath it is so great, that were the additional covering made use of allowed to lie flatly upon it, heat would be conducted from the entire apartment with very little less celerity than if the glass were exposed, or this last removed, and mats substituted for it; the only difference of result from the cases before mentioned being, that the *whole plant* would be rather more slowly robbed of its caloric, instead of at once merely having a single member frozen. Common garden mats are exceedingly well adapted for placing over the roofs of frames or houses, but they should never be so thrown on as to touch the glass. To avoid this, one or two small strips of wood can be fastened across the middle, as well as to the top and bottom of the frame; and if the mats are drawn tightly over these, and secured by strings, observing to have the former long enough to prevent any aperture being left, they will answer every desirable purpose infinitely better than they could if not sustained at a trifling elevation above the roof. Where Harrison's mode of glazing is adopted, the peculiarity of which is to dispense with wooden bars raised higher than the level of the glass, and thus present a perfectly flat surface; such a precaution is especially indispensable.

We have before noticed a kind of protection which we may here again commend to the consideration of all who study neatness, efficiency, and economy. For those sorts of plants which only need shelter in frosty weather, frames of such a description will entirely supersede the use of glazed lights, and they can be very easily manufactured; but they are quite as suitable for covering a glass roof, from which they will effectually prevent excessive radiation. We hope it has been here plainly proved *why* an elevated covering is to be preferred, for there is nothing which we so much wish to avoid as dogmatical assertion, or which we so much desiderate, even on the most scientific subjects, as succinctness. Conduction being but a continuation of the radiating process, where it is allowed full operation, the disparity between the escape of heat from a covered and uncovered glazed surface, when the materials are in contact with it, is only one of time and not of extent. PAX. BOT. MAG.

[We hope this subject will receive the attention of western Cultivators, and that we shall have the results of their experience.]

GINSENG.

BY R. B. LEUCHARS, QUINCY, MASS.

On reading the quack advertisements of the day, we find various preparations of Ginseng spoken of, and have very often been asked *what it is*—whether a mineral or vegetable production. I propose, therefore, to make a few remarks upon it, for the benefit of those of your readers, who do not know what it is.

Ginseng is a plant, which, at one time, was supposed to be solely indigenous to Tartary and China; but which, like many other of the imported varities, we now find indigenous and abundant in the United States and the Canadas; and, instead of importing the roots of this plant from China, it is, I believe, not an uncommon thing to export it hence to China; where the Chenese purchase it, as readily as they do that of native growth not recognising any difference.

The botanic name of this plant is *Panax quinquefolium*. It is perennial, with a purple stalk, roundish, and growing to a hight of about one foot, and sometimes to two feet. The plant has a peculiar appearance: the leaves and flower stem arising from the same stalk, or stem, and springing together from a thick joint at the extremity of the stalk. There are generally three leaves, and sometimes more of the digitated kind—each dividing into five simple leaves, which are of an irregular oval shape, with serrated edges, smooth and pointed, and generally of a deep green color. The flowers are prodused in a round terminal umbel and are of a whitish color and make their appearance from May until July.

The plant is generally found in cool, shady situations, among the woods; though I have also found it abundant on the banks of streams, growing in moist, rich soil. The root is about four or five inches, long, of a somewhat fleshy nature, which become wrinkled, when dried, and has a yellowish white color. To the taste, it has a mucilaginous sweetness, approaching to that of liquorice, accompanied with some degree of bitterness, and a slight aromatic warmth, with little or no smell. By some, it has been supposed to be similar to the roots of Fennel, but is much sweeter and pleasanter than those roots; and differs, also, remarkably, from them, in its nature and properties. The sweet matter of the ginseng being preserved entire in the watery as well as in the spirituous extract; whereas that of the fennel roots is destroyed or dissipated in the evaporation of the watery tincture. The slight aromatic flavor of the ginseng is also, in a measure, retained in the watery extract, and perfectly in the spirituous.

This plant seems to have acquired a fame and celebrity, lately, in the eyes of many, not at all commensurate with the estimation in which it is generally held by regular physicians, either in this country or in Europe; and I am inclined to think its reputation, like the celebrated sarsaparilla, is destined to be of an ephemeral nature; as its properties are much exaggerated, and its power over disease very much over-rated.

The Chinese have ascribed extraordinary virtues to the ginseng root, and have long considered it a sovereign remedy for almost all diseases, to which they are liable—having no confidence in any medicine, unless in combination with it. Some of the most eminent Chinese physicians have written volumes on the medical powers of this plant, asserting that it gives immediate relief in extreme fatigue, either of body or mind—that it dissolves superfluous tumors and eases respiration—strengthens the stomach—inproves the appetite and digestion—allays vomitings, and almost any other "ill that flesh is heir to." These and many effects of this root, equally extravagant, are related gravely by various authors, and from the manner in which this and some other medicinal plants, not more efficacious than itself, have been eulogized for selfish purposes in the United States, as well as in Europe, by some patent medicine makers, one would think that the preposterous and fanatical superstition of the Chinese, in relation to the virtues of ginseng, had been entertained in a superlative degree by many credulous physic swallowers of the present time.

Such was the faith of the Celestials in this physic, that they took it for every thing and on all occasions. One writer says that he never looked into an apothecary's shop in China, but they were always selling ginseng: that both poor people and those of the highest rank made constant use of it, and that they generally boil half an ounce in their tea or soup, every morning, as a remedy for consumption and other diseases.—The experience of physicians, however, whether in this country or in Europe, does not endorse the truth of these fancies or assertions, nor does it seem by them to be generally employed, on account of its inertness, and inactivity in producing sensible effects.

I regard to the culture of this plant, little may be said. It grows freely in any kind of rich soil, or peat earth, and is easily propagated by cuttings of the young, succulent tops, and also by the roots and seeds; but it is scarcily worth cultivating as an ornamental plant, and hardly as a useful one.

Celery and its culture.

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It is somewhat to be regretted that the persevering energy which has exhibited itself in the present day in searching out works of art and other remains of bygone days, should not likewise devote some part of its inquiries into the means that had been adopted to alter, improve, and, to a certain extent, re-model those objects in the vegetable world, which, by a happy arrangement, have been brought to such a condition as to minister so much to our necessities, as well as our gratification: for while the ponderous ruins of some city, which have laid for centuries untouched, or the no less impressive works of art, which, by the barbarous act of some ruthless invaders, had been buried in obscurity for countless ages, are again resuscitated by some enthusiastic adventurer, the applause of mankind is not withheld from the individual by whose aid this was done: but, if an inquiry be set on foot with a view to ascertain the native country and original character of any of the non-essential plants to our existence, it is often met with indifference, if not with direct contempt. Now this ought not to be so. What can be more interesting than to know "from what country did the Wheat have its origin, and what was its features when found?" It is, doubtless, a much altered plant from what it was then; yet we are at a loss to ascertain how this alteration was effected; whether it was done by one of those accidental causes by which we now and then see great results accomplished; or whether it was effected by a long and patient cultivation, in which a praiseworthy desire to improve a given object manifested itself, so as to produce, in time, the article to which we justly attach the significant title of "the staff of life." Now, wherever the native country of this plant may be found, it is certain that nothing exactly like it exists now in a wild state; and, doubtless, it has been so altered from the original as to leave but few traces of its identity; and it seems incredible that the wild offspring of its original parent should have ceased to exist, although this belief is maintained by some; while amongst others, embracing some of the best botanists of the day, a difference of opinion exists as to the identical species of plant to which the cultivated Wheat really does belong; and when such difference does exist, it would be superfluous to hazard an opinion, especially as so much has already been said about the matter by others well qualified to give a correct one. However, as there are many other plants, as well as Wheat, whose history it would be difficult, if not impossible, to trace, it would be better to let them alone, and direct attention to their culture as experience has established it at the present day. But as the one to which it is intended to devote the present chapter has not been so long in the smproved condition of a cultivated plant as the Cereals, and some other plants, it becomes a much easier matter to trace it to its source, or rather its original birth-place, and from thence we may possibly gain a little which may enable us to comprehend more fully the wants and requirements of the plant in question, which is no other than the much improved article *Celery*.

At whatever period this vegetable was first cultivated to the extent, and made subservient to the purposes to which we now put it, we need not here stop to inquire, for it cannot claim the antiquity that some other garden plants do; one thing, however, is known, that its qualities have much improved during the last half century, and if improvement continues to go on, much of the original rankness of the wild plant will have left it. But, as it will be necessary to mention its original home, it need afford no surprise by being told that it is indigenous with us, and that wild Celery is found in our ditches and other wet places in great abundance, and more especially in what is called the salt marshes; *i.e.*, those wet, marshy spots to which salt water has now and then access. In such places we may see it flourishing in all its native luxuriance, while its foliage has that strong smell which the cultivated varieties have in a much diminished force. One thing, however, is certain; the moist situation to which the wild plant owes its luxuriance is also best adapted to the growth of the more cultivated form; but then there are other considerations besides mere growth which ought to regulate the qualification of Celery in its now altered state. A rapid growth is not always consistent with good keeping qualities: and as this produce is expected to remain in use for at least eight months out of the twelve, it necessarily becomes important that it should be attended to in that particular. The process, however, is not difficult, and late Celery, of a good quality, is often found in places which have not the character of producing it in first-rate condition at an earlier period; for it so happens, that the means taken to insure a rapid and luxuriant growth are not always compatible with good keeping qualities. Nevertheless, both ends may be attained, to a certain degree, by attending to a few simple rules, which it is here intended to lay down.

The usable portion of this vegetable being the leafstalks when in a blanched state, and crowded together in such a firm com-

pact body as to have received the name of "a head," which also possesses a centre or heart, containing, in a like manner, some of those said leafstalks in embryo, but which are, nevertheless, expected to remain in that inactive state, which retains them as they are. In that condition, the tight clasping of the larger ones around them, and the latter being surrounded by earth or other substance, they necessarily undergo that process of bleaching, or blanching, which divests them of that green color and much of the rankness which the wild plant possesses; but after this process of blanching is effected, and the future progress of the plant checked, it naturally either falls into a state of decay, otherwise the growth takes another turn, and the intention of nature is now directed to the production of seed; consequently, the central portion of the plant is elongated, and a sticky portion from the middle (having the seed or flowering-buds in embryo) rises in the centre, which new portion is of a kind quite unfit for use, and speedily rendering the other portion useless also, completes the destruction of what once might have been good Celery. Now, as it is advisable to defer this state of things to the latest period, as well as to prolong the season of useful Celery, it is of importance that the ground on which Celery is planted should be duly considered before it is fairly committed to the earth.

There cannot be a greater mistake than to suppose that the conditions which bring Celery to the best possible state in September are the best for March likewise; for the former requires all the assistance that a rich manure can give it; the latter is not so gross a liver, its food being more solid than rich; consequently, it will easily present itself to the horticultural student, that for late use, Celery ought to be planted on rather dry ground, and that not too rich; for the too rapid growth of a plant in early autumn, and its suddenly ceasing to do so, is incompatible with its existing long in a sound, useful condition. Celery not being exactly like those root-crops which remain, to a great extent, inactive for several weeks together. On the other hand, Celery must either be growing or decaying. Now, in order to maintain a winter's growth in this plant, cold, wet soils are not the best to plant it in; but dry, sound ground, and that of a kind which does not harbor too many slugs to the injury, if not destruction, of this crop. However, as its growth and general treatment deserves to be more fully entered into than the limits of this chapter admits, I must leave the remainder until a future occasion, and desire that due care be taken of those plants which were pricked out in some generous soil in May, and that their need of plenty of water and other wants have been supplied. And be sure, in preparing the Celery trenches for the present year, take care and select some on the driest parts of the grounds on which to plant the later crop; on which it would be well also to limit the quantity of dung or other good things, so as to avoid that grossness so hurtful to the conservative powers of this plant.—C. M. Gars.

Sugar.—The refining of sugar is a process usually performed after exportation. It is boiled in pans with lime water and a portion of bullock's blood, or hydrate of alumina. The albumen of the blood mixes with the impurities of the sugar and rises to the surface, where it is skimmed off; the white of eggs and butter are said to be sometimes added. When purified in this way it is placed in coolers and agitated till it becomes thick or strained through woollen bags, or is made to pass through animal charcoal. It is then placed in conical iron or unglazed earthen qessels, the large end uppermost, when the remaining uncrystalized syrup runs off through the small hole in the apex. Wet pipe clay is then covered over the top an inch thick, the water of which drains through the sugar, carrying off the remaining coloring matter, and this is repeated. It is then carefully dried, and constitutes loaf sugar. It is refined or doubled refined according to the number of the operations. The green syrup which passes from the mould is made into lump sugar. The art of clarifying or making loaf sugar was the discovery of a Venetian about the first of the 16th century.

Sixty-three million pounds of raw sugar were refined in the 43 refineries of the United States in 1840. Almost all the sugar imported from beyond the Cape of Good Hope is refined here; $1,200,000 is paid annually to operatives in this business. The price at which refined sugar is afforded the consumer here is from 10 to 13 cents per pound; in England it is from 17 to 23 cents, and in France from 17 to 20 cents. From 100 ponnds of raw sugar (one-third white Havana and two-thirds brown) the product of refined is 51¾ pounds.

Candied sugar is made by dissolving common sugar, slowly evaporating the water, and re-crystalizing it: and is brown or white, according to the sugar used. This is the only sugar esteemed in the East. White sugar candy is the raw sugar boiled and clarified in moulds, as before described; it is made to crystalize in various ways. Besides the numerous uses and delicate preparations made of this, it is used by miniature painters to prevent colors from cracking when mixed with gum-Arabic. It is

much used with wheat flour to make sugar toys, &c. The value of confectionary made in the United States 1840, was $2,149,565, and the capital in the manufacture was 1,769,871, chiefly in Massachusetts, Louisiana, Pensylvania, NewYork and Maryland.—*Hand Book of Plants and Fruits.*

On the Preservation of Health.

THE GOOD EFFECT OF FREQUENT BATHING.

With the mercury at 90 degrees of Fahrenheit, what can be more natural, than to spend a few thoughts on the means of *counteracting the ill effects of such excessive heat?* And how can this be better done than by frequent ablutions of the whole body, so that every pore may be kept open, and free passage given to matter which the system rejects and would fain throw off by perspiration. We write in the full persuasion that bathing is too generally neglected in the country—either from want of thought upon its importance, or want of convenience for its enjoyment; but with a little trouble such convenience might be provided, wherever there is a good pump, or yet better where there is a copious spring of water. The facilities should not only be afforded, but those who have charge of families should make it a point to see that they are availed of by every member under his control. Ask the laboring man, him who labors with mind or body, and who is accustomed to being daily, or very frequently refreshed with the shower or plunging bath, what would induce him to forego it? Rising in the morning exhausted and languid from the effects of oppressive heat, he comes out from his bath invigorated and capable of thinking so much closer, and working with so much more alertness and satisfaction, that he would much sooner relinquish one meal a day than *give up his bath!*—He only who habitually enjoys it can estimate the privation when no means are to be had for the indulgence.

Those who have most studied the art of preserving health dwell upon *cleanliness of person*, as next in importance to be considered after *air and food.*

The happiness and success of every farmer depends so much on the health of all his household, that under the most fervid heat that has been felt here for the last ten years we do not see that we can better devote the space it occupies than in giving to his perusal and reflection the following paper, which seems to contain about all that need be said on the subject of it:

"This is not a matter of mere decency. It is one of the positive commands arising from the constituted order of things. Be it remembered, that every thing that lives, vegetable or animal, is wasting while life continues; and that all which is sent forth through the millions of openings by the skin, has run its round, and is lifeless: and that more than half of all the food taken comes forth in this manner. If perspiration, sensible and insensible, be permitted to rest on the skin, and stop the way of that which is coming, Nature is offended, and will show that she is so. Such neglect is one of the causes of disease. This fact was probably well known to Eastern nations, since it was part of their religious duty to cleanse the skin. These nations were ignorant of the modern comfort of wearing a garment next to the skin which can be frequently changed. The absence of this comfort was one of the causes of those dreadful diseases of which we read, and which are unknown among Christian nations.—There are classes of laborers and mechenics, whose health would be preserved, and their lives prolonged, if they knew how much depended on periodical cleansing. It may be said that there is a connexion between cleanliness and moral living. Perhaps it may be going too far to say, that those who habitually disregard cleanliness, and prefer to be dirty, have no moral perception: but it may be truly said, that those who are morally sensitive are the more so from respecting this virtue. There is a close affinity between moral depravity and physical degradation. The viscious poor are always shockingly filthy: the depraved rich are visited by worse penalties: they may have clean garments; but what can wash away the impurities which vice has made a part of themselves? It is not for one's self only that they possibly can, and do obtain their respect. Clean and costly garments may fall very short of doing this, if it be seen that they are a covering for the neglect of this important law. If there be a lovely object to the human eye, it is a clean, clear-faced, healthy, innocent, neatly-clad, happy child. There are few children who may not, if they will, be neatly dressed, for this does not depend on that of which the dress is made. There are fewer who may not have a clear skin, and healthy look, if they are properly fed, and sleep in pure air. There are none who may not have a clean skin; for we speak to those who are old enough to judge for themselves. And let it be added, for their inducement, that, in obeying the command to be clean, they are performing a moral duty; in neglecting it they are inflicting an evil on themselves in two ways—first, in diminishing their own comfort; second, in losing the esteem of others."—*From the Farmer's Library.*

A word for the Ladies.

The English women are healthy in body, and of course, in mind. Sickly sentimentalism, and a "rose-water philanthrophy." which expends itself over French romances and artificial flowers, has no lot or portion in their characters. They are *women*. And their children are worthy of them, for they are red-cheeked, of stout muscle and nimble gait, of fine health and appetite. The reason of all this is, that the English women exercise more in the open air than our women do. An English woman of refinement thinks nothing of walking a half dozen miles, nothing of riding on horseback twenty, nothing of leaping on the back of a trusty animal, and jumping hedges and ditches in pursuit of game.

I remember once being at William and Mary Howitt's, when some one proposed that we should make a little family visit to Epping Forest, distant some four or five miles. The thought never entered my head that they proposed going on foot. As we crossed the threshold of the door, I was expecting the next moment to help the two ladies making our party into the carriage; and when I asked where was the carriage, I got for a reply, "We are going on foot, of course!" and so we walked all the way there, and rambled all the day long over the beautiful forest, and at night walked back to "The Elms." I kept looking at the ladies while we were returning, expecting to see them faint away; and finally, when we all sat down on the greensward for a moment, I ventured very quietly to ask one of them, "Are you not very tired?" I got for a reply a merry, ringing laugh, and a "To be sure not;" I could walk half a dozen miles farther yet. When I got home, I was so fatigued as to be unable to stand without great pain and trouble, and was obliged to acknowledge that the English ladies were my superiors in physical powers of endurance. I saw at once the secret of their glorious health, their buoyancy and flow of spirits. It was their habits of exercise out of doors.

I was once conversing with an English lady, who was near eighty years old—the mother of a distinguished writer—upon this capital habit of walking, which the ladies of England have, when she broke forth with, "When I was a young woman, and in the country, I used to walk ten miles to church on a Sunday morning, and back again after service!" Another cause of the brilliant health of English women, is their national love for horticulture. An English lady is at home in her garden among the flowers, and I know of no more beautiful sight in the world than that of a fair, open-browed, rosy-cheeked woman among a garden full of choice plants and gorgeous flowers. Talk of your merry creatures in hot drawing-rooms, "by the light of the chandelier" to the marines! Here is beauty fresh from God's hand and Nature's—here are human flowers and those of Nature blooming together.—*Mrs. Stowe.*

The Peach Rot.

The yellows which is indicated by the color of the leaves and the rotting of the peach, and is thought to be incurable, is said to threaten the existence of this valuable fruit. It is, probably, attributable to the exhaustion of certain organic instruments in the soil, by continued cultivation—probably prussic acid, in which the peach, cherry, and plum abound. As the cherry has now to our knowledge been subject to this disease, it would be well to inoculate the peach into cherry stocks, those of the wild cherry in particular, as it is proof against the borer. The wild peach, which grows in Georgia and other Southern States, has been tried on Long Island, but with what results we do not know. Unlike the common peach, it has green instead of yellowish twigs, and its foilage is darker. It may be inferred from this that it possesses more of that principle, the absence of which causes this malady.

An experienced pomologist states a fact that we have never seen published, and that is, that to produce a particular variety of peach, instead of noculating it, is only necessary to plant the entire fruit in the Fall. If the peach be dried it will do equally well. It is a simpler and cheaper method, and the tree comes into bearing sooner. We can account for the above result by the well known law of nature, by which like produces like, which is strengthened when the pulp, which is the natural manure for the germ in the kernel, containing essential ingredients of the parent stock, nourishes its productive vigor. This theory was confirmed by the demonstration of several trees which had evidently never been budded, and whose fruit was identical with that of their progenitor.

The writer of this article once knew a large peach tree which was associated with his earliest recollections, and upon inquiry found that it was more than forty years old, while several generations of similar trees, in the same soil, had passed away. In New-Jersey and Delaware, it is necessary to renew the peach orchard every five or six years. This led to examination, and a bed of tansy was discovered about the trunk. Now, as this plant is very noxious to insects, its essential oil being

used by entomologists to kill their specimens, and by old-fashioned housewives as a vermifuge and bug bane, it was naturally inferred that the preservation of this tree to such a green old age, was attributable to the presence of this plant. It was decided to try the experiment on others, and accordingly a few of the roots were placed about each of the other trees on the premises, some of which gave signs of decay. These roots spread rapidly, so that it is necessary every year to cut away a portion of them. Not only has it prserved for several years the sound trees, but renovated those that were unsound. The odor of the plant doubtless keeps off the insect enemies of this kind of tree, and it might have the same effect on others, as the plum, apple and pear, as well as the elm, sycamore, and other ornamental trees.

Transplanting of Trees.

The following communication contains many wholesome rules with respect to the transplanting of trees and subsequent management of them. We commend the article to our readers:

It is frequently the case, that a tree which has received all the care and attention which can be bestowed upon it by the most experienced nurceryman, is transplanted to a soil of very inferior character, and being thus stunted in its growth, is the frequent cause of dissatisfaction to the purchaser. The planter should therefore bear in mind, that it is impossible for the soil in which a tree is planted, to be too rich, and that the rapidity of the growth and its subsequent productivenss, are very much influenced by the proportion of fertalizing matter contained in the soil.

For planting an orchard, the ground should be well cultivated before and after the trees are planted, and as highly manured as the means of the cultivator will admit. It is impossible for a tree to flourish, as it should, when the roots are surrounded and covered with a thick sod. When the tree is isolated, as in a garden or lawn, a rich compost of earth and manure should be dug in around the tree, care being taken that no pure manure be allowed to come immediately in contact with the roots. The ground about these, also, for the space of two or three feet, should be kept mellow until the tree is of large size, and it would also be well to dig in a portion of manure about the roots every spring.

Many of the most experienced cultivators regard the Fall, immediately after the first hard frost has arrested the growth, as the season for planting every variety of trees but evergreens, which should be planted during the last days of Spring, or the first of Summer. Where, however, it is not convenient for the cultivator to give them attention in the Fall, deciduous trees may be deferred until Spring.

The reason of this preference for the Autumn is obvious; when trees are transplanted at that season, the earth becomes, during the winter, properly settled about the roots, and they are ready to throw out fibres in the Spring. The Spring is preferred for evergreens, for the reason that their period of hiberniation differs from that of deciduous trees, and experience has shown that they succeed best when thus planted. When a tree is removed, great care should be taken to preserve the roots uninjured and entire; if this precaution has not been observed, the tops should be lessened in proportion to the loss sustained by the roots.

When the tree has been some time out of the ground it is well to immerse the bodies and roots in water for about twenty four hours; this will much benefit the tree, and advance its vegetation. The holes for receiving them should be sufficiently large to admit the roots without crowding and bending—from three to six feet in diameter, and from one to two feet deep, according to the size of the trees. The subsoil should be entirely removed to this depth, and its place filled with rich mould, well combined with compost or manure fully fermented. All bruised and broken roots should be shortened and smoothly pared with a knife. Let a person hold the tree upright, while the operator pulverizes the earth, and scatters it among the roots. Let the tree be shaken gently while this is being done, and let the earth be carefully filled in around every root, even the smallest fibres; it is all important that the soil should come in contact with every portion of the roots. When the whole is three quarters filled, pour in three or four gallons of water, and after it has settled away, fill up the hole, pressing the earth around the tree with the foot. Earth watered in this way will retain its humidity a long time, while the water poured on the surface, after the hole is filled, is very injurious, causing the top of the soil to bake to such a degree as to prevent the access of air and light, both of which are highly essential to the prosperity of the tree. One of the most universal and fatal errors in planting trees, is placing them to deep; we have known many fine and thrifty trees die from this cause alone; they should not be planted more than one inch deeper than they stood in the nurcery, and if the frost is likely to heave them the first winter, a small mound can be heaped about the stem to be removed again in the Spring.

By attending to the preceding suggestions, we feel assured that the cultivator will be amply repaid for any extra trouble or expense, by the consequent increased growth, beauty, or productiveness of the tree.—*Am. Farmer.*

Sources of Vegetable Matter.

BY DAVID CHRISTY.

The *elements* entering into the composition of vegetable matter, are of two kinds—*organic* and *inorganic*. The former class of elements, comprising by far the larger portion of the bulk of vegetable bodies, consists of those parts which during combustion, disappear in the state of gasses, and the latter, of those that remain in the form of ashes. Combustion, therefore, in effect, is merely a separation of the organic from the inorganic elements of the substance which is burned. The same may be said, also, of the process of *digestion*. Vegetables, eaten as food by animals, undergo a process, in digestion, similar in its effects with that which takes place in their combustion: a separation of the organic and inorganic parts being effected, by which the former are converted into flesh and blood, while the latter pass off as excrement.

The process of decay, or *decomposition*, which dead trees and plants undergo, produces the same results as those of combustion and digestion: it being only a much slower one, and requiring years to accomplish that which, in the other case, is done in an hour or a day.

By careful analysis, chemists have also discovered that the *ashes* of plants, left by burning, do not contain a single *inorganic element* that did not belong to the soils in which they grew; and repeated experiments have demonstrated, that a plant will not come to perfection in soils lacking any one of the elements found in the ashes of the mature plant of the same kind or species, except that one of the *alkalis* is sometimes substituted for another. It is inferred from this, that all the *inorganic* parts of vegetables are derived from the soils: that is to say, all that portion of vegetable matter which remains in the *ashes* after combustion, is taken up from the earth during the period of the growth of vegetables.

An examination will show how fully the chemical constituents of the ashes of vegetables correspond with those of the soils, and these, again, with those of the rocks from which the soils have been derived. Such an investigation will enable the reader to see, very clearly, the relations existing between the *earth* and the *vegetable kingdom*. A comparison of the organic elements of vegetables, with the elements of the atmosphere, will also show that with a single exception, they are all derived from the atmosphere. The relation, then, that the earth and atmosphere bear to the vegetable kingdom, is this: the earth supplies to all vegetables the *inorganic* elements of their growth, while the atmosphere affords to them their *organic* elements.

In proceeding to describe the chemical elements to which reference has been made, the *gases* claim the precedence, as occupying the most important position; and these being disposed of, the remaining part of the chapter will embrace a notice of the *non-metallic* elements, existing as solids at the common temperature.

Oxygen is a permanent gas, when uncombined, and is the most extensively diffused element in nature. It forms more than one-fifth part of the atmosphere, and nearly eight-ninths, by weight, of the waters of the globe; enters as a constituent into nearly all the earths and rocks, and, with a few exceptions, into all organic products. *Oxygen gas* is prepared by disengaging it from some substance with which it has entered into combination. By means of the galvanic battery, it may be obtained in large quantities from water, and, by the action of heat, from the oxyd of mercury, oxyd of manganese, or chlorate of potash. Oxygen may be made to unite with all the other elements except *fluorine*, and forms what are called *oxyds*, of which the rust of iron is an example. With the same element oxygen often unites in several proportions, forming a series of oxyds, which are distinguished from each other by the different prefixes enumerated in chemical nomenclature. Many of its compounds are *acids*, particularly those which contain more than one equivalent of oxygen to one of the other elements, and compounds of this nature are those which it most readily forms with the *non-metallic* elements: such as *carbonic acid* with carbon, *sulphuric acid* with sulphur, and *phosphoric acid* with phosphorus. But oxygen unites in preference with single equivalents of a large proportion of the *metallic* class of elements, and forms bodies which are called *bases:* such as *potash* with potassium, *soda* with sodium, *lime* with calcium, *magnesia* with magnesium, *protoxyd of iron* with iron, &c. A certain number of its compounds are neither *acid* nor *alkaline*, and are therefore called *neutral* bodies: such as the *oxyd of hydrogen*, or water, &c. The presence of oxygen is essential to the support of *respiration* in animals, to the *combustion* of vegetable or animal substances, and to the *growth* of plants.

"The combinations of oxygen, like those of all other bodies, are attended with the evolution of *heat*. This result, which is often overlooked in other combinations, in which the proportions of the bodies uniting, and the properties of their compound, receive most attention, assumes an unusual degree of importance in the combinations of oxygen. The economical applications of the light and heat evolved in these combinations, are of the highest consequence and value, oxidation alone, of all chemical actions, is practiced, not for the value of the products which it affords, and, indeed, without reference to them, but for the sake of the incidental phenomena attending it. Of the chemical combinations, too, which we habitually witness, those of oxygen are infinitely the most frequent, which arises from its constant presence and interference as a constituent of the atmosphere. Hence, when a body combines with oxygen, it is said to be *burned*; and instead of undergoing oxidation, it is said to suffer *combustion;* and a body which can combine with oxygen and emit heat, is termed *combustible*. Oxygen, in which the body burns, is then said to support combustion, and called a *supporter* of combustion.* But every case of combustion, however familiar to us, is only a process of *oxidation*, in which the oxygen of the air combines with the particles of the burning material. This is as true of the rapid burning of wood as it is of the rusting of iron. Both are the results of the combination of oxygen with these substances. But the oxidation of iron proceeds so slowly, that the heat evolved is dissipated as fast as produced, and never accumulates, while the more rapid oxidation of wood evolves heat in abundance. The oxidation of iron, however, can be made to progress with such rapidity as to produce a sensible evolution of heat, by introducing an iron rod, at a red heat, into oxygen gas. But iron is not the only substance that has its power of combining with oxygen increased by an increase of temperature. The affinity which all ordinary combustibles have for oxygen, is greatly promoted by heating them, and is rarely developed at all, except at a high temperature. For this reason, to insure the commencement of combustion, it is commonly necessary that the combustible be heated to a certain point. But the degree of heat necessary to inflame the combustible is, in general, greatly inferior to what is evolved during the progress of the combustion; so that a combustible, once inflamed, maintains itself sufficiently hot to continue burning until it is entirely consumed. Here the difference may be observed between combustion and simple *ignition*. A brick heated in a furnace till it is red hot, and taken out, exhibits ignition, but has no means within itself of sustaining a high temperature, and soon loses the heat which it had acquired in the fire, and, on cooling, is found unchanged. *Combustion* does not take place, as the brick includes no combustible matter to support it.

The oxidable or combustible constituents of wood, coal, oils, tallow, wax, and all ordinary combustibles, are the same, namely *carbon* and *hydrogen*, which, in combining with oxygen, at a high temperature, always produce carbonic acid and water; the volatile bodies which disappear, forming part of the smoky column that rises from the burning body. In combustion, no loss whatever of ponderable matter occurs; nothing is annihilated. The matter formed may always be collected without difficulty, and is found to have exactly the weight of the oxygen and combustible together, which have disappeared.

The discovery that heat is evolved in the combination of chemical elements with each other, serves to explain the principle upon which the consumption of food by animals tends to keep up the heat of their bodies. The degree of heat evolved, depending upon the rapidity with which combustion proceeds, and the rapidity of combustion upon the degree of temperature at which the combustible comes into contact with oxygen, it follows that the heat evolved in the *combustion, digestion*, and *decomposition* of vegetable or animal substances, must be very different in degree in these several cases. The evolution of heat during decomposition, with a few exceptions, is generally imperceptible to the senses.

HYDROGEN. — This gas does not exist, uncombined, in nature; at least, the atmosphere does not contain any appreciable proportion of hydrogen. But it is one of the elements of water, and thus enters into nearly every organic substance. This gas is obtained pure by decomposing water, or some other substance with which hydrogen has combined. The Tables exhibit hydrogen as every where present, in all animal and vegetable substances, and in some minerals. It is indispensable to the vegetable and animal kingdoms. It is eminently combustible, and burns when kindled in the air, with a yellow flame of little intensity, which moistens a dry glass jar held over it; the gas combining with the oxygen of the air in burning, and producing water.

NITROGEN, besides constituting a portion of the air, enters into the composition of

* Graham.

most animal, and many vegetable substances. This gas is usually procured by allowing a combustible body to combine with the oxygen of a certain quantity of air confined in a vessel, by which process the nitrogen is left free. It is a singularly inert substance, and does not unite directly with any other single element, under the influence of light or of a high temperature, unless, perhaps, with oxygen and carbon. To combine it with another body, requires the adoption of a circuitous method. A burning taper is instantly extinguished in this gas, and an animal soon dies in it, not because the gas is injurious, but from the privation of oxygen, which is required in the respiration of animals. Nitrogen appears to be chiefly useful in the atmosphere as a diluent of the oxygen, thereby repressing, to a certain degree, the activity of combustion and other oxidating processes. By reference to the Tables of organic analysis, it will be seen that nitrogen is a constituent of the nutritious articles of food, both animal and vegetable.

Ammonia.—This gas is a compound of hydrogen and nitrogen, in the proportion of *one* atom of nitrogen to *three* of hydrogen. It is produced in the *destructive distillation* of all organic matters containing nitrogen, which has given rise to one of its popular names — the spirits of hartshorn: there being a large per cent. of nitrogen in deer's horns. It is also produced during the *putrefaction* of the same matters, and finds its way into the atmosphere.

Ammonia is a colorless gas, of a strong and pungent odor. It is inflammable in air in a low degree, burning in contact with the flame of a taper. Water is capable of dissolving about 500 times its volume of ammoniacal gas in the cold, and the solution is always specifically lighter, and has a lower boiling point than pure water. Ammonia, in solution, is decomposed by chlorine. It is distinguished as the *volatile alkali*, as it restores the blue color of litmus paper reddened by an acid, and exhibits, in other respects the properties of an alkali. Ammonia forms several classes of compounds with acids and salts, and exhibits highly curious reactions with many other substances. It will be seen, as we proceed, that it is a highly important agent in agriculture.

Chlorine.—This is one of the simple, gaseous elements, is of a pale-yellowish green color, has a peculiarly suffocating odor, is capable of being condensed into a limpid liquid of a bright yellow color, has not been consolidated by freezing, and is easily combined with water. It exists abundantly in sea-water, and combines with sodium to form *common salt*. It destroys all vegetable and animal coloring matters, and hence is invaluable for bleaching linens and muslins. In combination with lime, it acts as a powerful disinfecting agent, in freeing the atmosphere of hospitals, close rooms, and cellars, from impurities generated by the decomposition of vegetable and animal substances. It combines with all the metals, and in the same proportions as oxygen; and, with three or four exceptions, these compounds are soluble and sapid.* It is also absorbed by alkaline solutions. It does not, under any circumstances, unite directly with oxygen, although several compounds of these elements can be formed: nor is it known to combine directly with nitrogen or carbon. It is "the leading member of a well marked natural family, to which also bromine, iodine, and fluorine belong. Phosphorus, carbon, hydrogen, sulphur, and most of the bodies of this class, have little or no action upon each other, or upon the mass of hydrogenous, carbonaceous, and metallic bodies to which they are exposed in the material world; all these substances being too similar in nature to have much affinity for each other. But the class to which chlorine belongs ranks apart, and, with a mutual indifference for each other, they exhibit an intense affinity for the members of the other great and prevailing class—an affinity so general as to give the chlorine family the character of extraordinary chemical activity, and to preclude the possibility of any member of the class existing in a free and uncombined state in nature. The compounds, again, of the chlorine class, with the exception of those of fluorine, are remarkable for solubility, and, consequently, find a place among the saline constituents of sea-water, and are of comparatively rare occurrence in the mineral kingdom; with the single exception of *chloride of sodium*, (common salt,) which, besides being present in large quantities in sea-water, forms extensive beds of *rock salt* in certain geological formations."†

Although chlorine, as has been stated, does not combine directly with oxygen, nitrogen, or carbon, and may be mixed with hydrogen and preserved in the dark without uniting, yet a combination of these two elements is produced, with explosion, by the introduction of spongy platinum, or the electric spark, or by exposure to the direct rays of the sun. Even under the diffuse light of day, combination of these two gases takes place rapidly, but without explosion. Chlorine has such a strong

* Having a taste.

† Graham's Elements of Chemistry, p. 329.

affinity for hydrogen as to decompose most bodies composing that element, and in this process *hydrochloric acid* is always formed. This is the *muriatic acid* of commerce. The affinity of chlorine for most metals is equally great: antimony, arsenic, and several others, showered in powder into this gas, take fire, and produce a brilliant combustion.

Chlorine, in some of its combinations, exists in all productive soils, and, from its active properties, in producing chemical changes upon nearly all animal, vegetable, and mineral substances, it is a most important agent in agriculture.

Cyanogen.—This gas, though a compound of carbon and nitrogen, unites with other elements exactly in the same manner as though it were itself an element, and forms an exception to the rule, that simple bodies can only combine with simple, and compound only with compound bodies. It comports towards other bodies in a manner similar to that of chlorine, iodine, and fluorine. With iron it forms *prussian blue*, and with hydrogen the *prussic acid*. Under pressure this gas is condensed into a limpid liquid, which evaporates again on removal of the pressure. Cyanogen is *salt-radical*, and unites with all the metals as chlorine and iodine do, forming a class of *cyanides*. It may be obtained pure from the cyanide of mercury.

Fluorine.—This substance has not hitherto been isolated, by the utmost skill of the chemist, as its powers of combination are such that no simple body has been found capable of resisting its action. It is found as a component of a few mineral substances only; one of these, *fluor spar*, is very abundant, and is noticed under the head of Lime and its compounds.

This closes our notice of the simple gaseous bodies. Those named hereafter are formed by the union of one of these gases with some one of the solid elements.

Carbon is found in great abundance in the mineral kingdom, united with other substances, as in coal, of which it is the basis, and in the acid of carbonates. It is also the most abundant element of the solid parts of both animals and vegetables. It exists in nature, or may be obtained by art, under a variety of appearances, possessed of very different physical properties. It occurs crystallized in the *diamond* and *graphite*, or *black lead*, uncrystallized in *wood charcoal*, *anthracite coal*, &c. Carbon may be said to surpass all other bodies whatever in its affinity for oxygen at a high temperature; and being infusible, easily got rid of by combustion, and forming compounds with oxygen which escape as a gas, this body is more suitable than any other substance to effect the reduction of metallic oxyds: that is, to deprive them of their oxygen, and to produce from them the metal, with the properties which characterize it. When heated to low redness, it burns readily in air or oxygen, forming *carbonic acid* by its union with oxygen. The prominent position which carbon occupies in the composition of vegetable and animal substances, may be seen in the Tables.

Carbonic Acid.—This gas is formed by the union of oxygen and carbon, in the the proportion of *one* equivalent of carbon to *two* of oxygen. It is easily prepared from fragments of marble, limestone, or chalk, by pouring upon them sulphuric acid, or muriatic acid. It is thrown off from the lungs of all air-breathing animals. It is also a product of vinous fermentation, and is largely produced in the burning of wood or coal. It is discharged from the earth by active volcanoes, and from fissures in their neighborhood, long after they are extinct. It is evolved in the decomposition of animal and vegetable matter, and accumulates in vaults and wells as the *choke-damp*, occasionally so fatal to those who descend incautiously into such places. Although enormous quantities of carbon are constantly abstracted from the atmosphere in the growth of plants, yet the supplies from the above named sources, and a few others, seem amply sufficient to prevent any sensible diminution of its carbonic acid. It would seem that the decomposition of the vegetation of one period supplies the necessary elements for the productions of the succeeding one, and that thus the amount of carbon in the atmosphere is kept constantly equalized.

Sulphur is distributed very generally throughout the earth by means of its combinations with minerals and metals, which, in their decomposition, supply this element to the soils. It is furnished abundantly from many volcanoes no longer in a state of much activity, where it is collected for the supply of commerce. It is supposed to be the strongest chemical body, next to oxygen, and has, like it, a powerful affinity for all other elements. Sulphur, or its acids, unites with iron, lead, copper, zinc, lithia; with oxygen, hydrogen, nitrogen, carbon, phosphorus, ammonia; with silicon, alumina, potash, soda, lime, magnesia, manganese; with fibrin, gluten, starch, albumen, blood, cartilage, etc. Its other combinations, which are numerous, have little connection with agriculture, and need not be noticed. Sulphur burns readily at a very moderate heat, and is used in connection with phosphorus in the manufacture of friction matches. Possessing such

active properties, sulphur is ever ready to perform its offices in the vegetable and animal kingdoms. SULPHURIC ACID, one of its most powerful products, in combination with oxygen, consists of *one* equivalent of sulphur and *three* of oxygen.

PHOSPHORUS is essential to the organization of the higher orders of animals, being found in their fluids, and forming, in combination with lime, the basis of the solid structure of their bones. It is also found in most plants and minerals. Phosphorus, in its properties, is very closely allied to sulphur, but melts, boils, burns, and evaporates far more easily than that element. So readily does the oxygen of the atmosphere act upon it, and produce combustion, that it must be kept, and also cut, under water, especially when the atmosphere is at the temperature of summer heat. It is on this account that it is so valuable in the composition of friction matches, the temperature being sufficiently raised by a very little friction to ignite it. it is soluble in ether, alcohol, sulphuret of carbon, and oils. It is an exceedingly violent poison, and is used to extirpate rats and mice. Phosphorus is susceptible of four different degrees of oxidation—the highest of which is a powerful acid, and the acid character is not absent even in the lowest. Phosphorus, or its acids, has the power of combining with hydrogen, oxygen, nitrogen, chlorine, sulphur, ammonia, alumina, potash, soda, magnesia, lime, iron, manganese, lithia, and a large range of other elements, not connected with the growth of vegetation. With such extensive affinities, phosphorus must be an important element in soils. PHOSPHORIC ACID, which is so often named in the Tables, consists of *one* equivalent of phosphorus and *five* of oxygen.

SILICA, SILEX, or QUARTZ, which occurs so abundantly in the inorganic parts of vegetables, is a compound of oxygen and SILICON, in the proportion of about *one* part of the latter to *three* of the former. It constitutes a number of minerals, nearly in a state of purity; such as common quartz, rock crystal, flints, sand-stone, chalcedony, carnelian, agate, opal, common sand, and the water-worn white pebbles, met with almost everywhere. It also enters largely into combination with other substances, to form the rocks of the globe. It exists in two states in soils, *soluble* and *insoluble*. In its soluble state, it is taken up by plants during their growth, and constitutes a part of their mass, entering largely into the composition of the stalks of reeds and grasses, which have often a thick crust of silica on their bark. It is a very abundant mineral, and is estimated to constitute one-sixth of the crust of the globe.

But it is not in the bark of plants alone, that silica is met with by the chemist. It is diffused generally throughout the structures in which it occurs, says Quekett,* the latest writer on the subject, and in this connection is so intimate and equable, that it forms a complete skeleton of the tissues after the soft vegetable matters have been destroyed; in fact the part it plays in reference to the organized tissues in which it is deposited, is precisely analogous to that existing between the animal and earthy elements of shell. Silica exists in such great abundance in the cuticle of a plant known as *equisetum hyemale*, or Dutch rush, that on this account the stems are employed by carvers in wood and modelers in clay, as a substitute for sand paper. It is also very abundant in the canes, but is by no means limited to this order of plants. It is contained principally in the cuticle, or outer bark, and in the various structures that are developed from it, such as hairs, spines, etc.; but in some instances layers of cells, lying much deeper than those of the cuticle, also abound in silica; and it may also be met with in woody fibres and in spiral vessels. In the burning of a haystack, masses of perfectly formed glass are always to be found among the ashes. This glass is produced by the combination of the silica of the cuticle of the hay with the potash of the woody fibre—glass being a silicate of potash.

In order to display effectually the siliceous matter in plants, it is necessary to expose the tissue under examination, to the flame of the blow-pipe, or, better still, to boil it for some days in nitric acid. By these means the organic portion is entirely destroyed, and the silica, withstanding these destructive agents, remains as a perfect model, or cast of the original tissue. In the husk of a grain of wheat, not only the cells of the cuticle, and layers of cells beneath, but also the fibres of the spiral vessels are silicified. Of all the grasses or grains used as food by man, rice contains the largest proportion of silica. In the husk of the rice, the woody fibres are also coated with silica; and in wheat, oats, and other grains, not only the stalks, but the hairs which stud the surface of their husk, partake largely of the siliceous deposit.

It will now be apparent that a vast amount of *silica* is yearly removed from our soils by the cultivation of the ordinary grains and grasses, and that a supply of this substance may be necessary to many soils, in order to insure good crops.

BORON is an element sparingly diffused in nature, and having some analogy to car-

* London, 1852.

bon. It is never found except in combination with oxygen, as BORACIC ACID. It is a constituent of several minerals, but the main supply of borax to commerce is from certain hot lagoons in Tuscany, and likewise from the hot springs of Lipari, and a few other places. It communicates fusibility to many substances in uniting with them, and generally forms a glass. On this account borax is much used as a flux. with the assistance of the vapor of water, it is slightly volatile, but alone it is more fixed, and fuses, under a red heat, into a transparent glass. Boracic acid is remarkable for the variety of proportions in which it unites with the alkalies.

All the foregoing elements are *non-metallic*. A brief review of their peculiar properties will close our remarks upon them.

Oxygen, hydrogen, nitrogen, and carbon, form the chief elements of plants and animals, and are, for this reason, called *organogens*, or generators of organic bodies.

Sulphur and phosphorus, with some of their compounds, are characterized by such great inflammability, that they have been called *pyrogens*, or fire generators.

Chlorine, iodine, bromine, fluorine, and Cyanogen, on account of their power of producing *salts* in combination with the *metals*, have been called *halogens*, or salt producers. Their compounds are called *haloid salts*, to distinguish them from the *oxygen salts*, which consist of an acid and a base.

Silicon and boron occur in nature only in combination with oxygen, as silica and boracic acid. These substances are oxyds, and form amorphous salts with many bases. such as glass, slag, glazing, etc., and for this reason they have been called *hyalogens*, or glass producers.

Having disposed of the gases and non-metallic elements, the *light metals* may be next considered. They are called light metals, because they are specifically lighter than other metals. These metals, so far as they are connected with agriculture, may be noticed in the following order:

1. Potassium, sodium, and lithium, the metallic bases of the *alkalies*.

2. Calcium, magnesium, barium, and strontium, the metallic bases of the *alkaline earths*.

3. Aluminum, and several kindred but rare metals, the metallic bases of the *earths*.

All these metals have such a strong affinity for oxygen, that they are usually met with only as oxyds, and it is to their properties in this form, that attention will be directed. The process by which the pure metals are obtained, can be learned from the common chemical works.

POTASH, or POTASSA, is an *alkali*, formed from its metallic base, *potassium*, by the chemical union of oxygen with this metal. This element is capable of forming several compounds with oxygen, and also enters into chemical combination, in various proportions, either as potassium or potash, with sulphur, chlorine, iodine, iron, cyanogen, carbon, hydrogen, nitrogen, silica, acetic acid, tartaric acid, oxalic acid, etc.. The extent of its presence in minerals and vegetables, can be learned from the Tables. Its capacity for combining with so many of the elements existing in soils, and its almost constant presence in plants and trees, render it indispensable to the growth of vegetables.

SODA is an alkali, formed from its metallic base, *sodium*, by the chemical union of oxygen with this metal. Soda and sodium are capable of forming compounds with sulphur, chlorine, carbon, nitrogen, phosphorus, iodine, silica, boracic acid, etc. Like potash, it is of much importance in soils, as it enters largely into the composition of certain vegetables. In combination with chlorine, it forms *common salt*, which is the chloride of sodium, and with sulphur it produces the *glauber salts*, or sulphate of soda. "As potassium is in some degree characteristic of the vegetable kingdom, so sodium is the alkaline metal of the animal kingdom, its salts being found in all animal fluids."—*Graham*.

LITHIA, which is an oxyd of *lithium*, is not an abundant element. It exists in small quantities in a few minerals, and is met with in a few vegetables. Lithia and lithium enter into combination with chlorine, hydrogen, carbon, sulphur, soda, phosphorus, fluorine, etc. It is an *alkali*, like potash and soda.

LIME is an *alkaline earth*, having *calcium* for its base, and is formed by the chemical union of oxygen with that metal. Lime and calcium form chemical combinations, with carbon, sulphur, chlorine, phosphorus, nitrogen, hydrogen, fluoric acid, etc. Uncombined lime, or quick lime, which is the pure *oxyd of calcium*, can be obtained by heating common limestone to redness. This rock is a *carbonate of lime*, consisting of 43.71 parts of carbonic acid and 56.29 of lime in 100 parts. Marble, calcareous spar, chalk, marl, coral, the shells of moluscous animals, etc., are all carbonates of lime, more or less pure. In burning any of the marbles or limestones, the heat drives off the carbonic acid, and leaves the pure oxyd of calcium or common lime.

Lime, in combination with sulphur, forms *sulphate of lime*, or *gypsum*, which is composed of sulphuric acid 46.31 parts, lime 32.90, and water 20.79, in 100 parts. Heated to a proper temperature, the water

is driven off, and *plaster of Paris* produced. Gypsum possesses highly beneficial properties as a fertilizer of soils. *Phosphate of lime* is composed of phosphoric acid 48.45 parts, and lime 51.55, in 100 parts. This mineral enters largely into the composition of the bones of animals. The *fluate of lime*, or *fluor spar*, is composed of fluorine 47.73 parts, and lime 52.27, in 100 parts. This mineral forms a very small portion of the earth of bones, but a somewhat larger proportion of the enamel of teeth. The *chloride of lime* has been noticed under the head of chlorine. Lime, in its various combinations in soils, performs the most important offices to vegetation, while at the same time it supplies a portion of the materials of the growth of plants.

Magnesia is an alkaline earth, having *magnesium* for its base, and is formed by the chemical union of oxygen with that metal. Magnesium has the color and lustre of silver. It is very ductile, and capable of being beaten into thin leaves, fuses at a gentle heat, and crystallizes in octahedrons. It undergoes no change in dry air or oxygen, but is oxydized superficially by moist air. Magnesium, when heated to redness, burns with great brilliancy, forming magnesia, or the oxyd of magnesium. Magnesia is extensively diffused in the mineral kingdom, forming a large per cent. of the chloritic, talcose, and serpentine rocks, and is also a constituent of hornblende and one variety of mica. Carbonate of magnesia occurs native as a hard, compact mineral, in the proportion of magnesia 48 parts, carbonic acid 49, and water 3, in 100 parts. Magnesia is also extensively diffused in combination with lime, as a rock, called, *dolomite* or *magnesian limestone*, which is composed of carbonate of lime 54.18 parts, and carbonate of magnesia 45.82 parts, in 100. Magnesia, or its base, combines with silica, boron, carbon, hydrogen, chlorine, sulphur, phosphorus, nitric acid, and ammonia.

Baryta and Strontia are also *alkaline earths*, and have a great similarity to lime in their properties and combinations, but need not be noticed in detail in a work on agricultural chemistry.

Alumina is an oxyd of *aluminum*, formed by the union of *three* parts of oxygen to *two* parts of this metal. It is the only one of the *earths proper* that occurs in abundance. It exists in its pure state, with the exception of a trace of coloring matter in the *sapphire* of which the oriental *ruby* and *topaz* are varieties. *Emery* is nearly pure alumina. All these substances are extremely hard, being, in that respect second only to the diamond. Like silex, alumina is an abundant ingredient in many minerals and slaty rocks, and is the principal constituent in clays. In combination with sulphuric acid and potash, it forms *alum*, and may be obtained in its metallic state from this salt. Its great capability of absorbing water, renders it of vast importance in soils, as a means of supplying moisture to the roots of vegetables. Its affinity for vegetable and mineral *coloring matters*, and its power of retaining and rendering them insoluble, connected with its equally powerful affinity for *ligneous fibre*, makes alumina indispensable in the arts and in manufactures. It also absorbs carbonic acid and ammonia, and supplies these two elements to vegetables. In combination with silica, it supplies the clays for bricks, porcelain, earthen-ware, stone-ware, etc. Alumina, or its base, enters into combination with hydrogen, chlorine, iodine, bromine, fluorine, nitrogen, sulphur, potash, soda, lithia, magnesia. manganese, iron, selenium, phosphorus, cyanogen, borax, etc.

"Next to silica, alumina occurs most frequently in nature, and, indeed, not only in clay and loam, but also in rocks and minerals; for instance, the well known gray colored clay-slate, porphyry, etc. Feldspar must be regarded as the most important of the alumina minerals, and is found in greater or less quantity in granite, gneiss, mica slate, and other rocks. Feldspar, like other stones, is finally disintegrated by the influence of air and water, and by heat and cold; it weathers, as the miners say, or is dissolved, and the silicate of potassa is thereby gradually removed by the water, so that, as the result of this decomposition, clay or loam remains behind. When the farmer lets his plowed land lie *fallow*—that is, remain uncultivated for some time—he by this means accelerates the weathering; soluble salts, potassa, soda, lime and other salts are thereby formed from the constituents of the soil, and to these salts especially, is to be attributed the greater fertility of fallow land over that which has been exhausted by cultivation."—[*Stockhardt*.] The same process of decomposition takes place in the other minerals of the rock composing the earth's crust, and by this means soils are produced.

Glucinum, and the several other metallic bases of the *earths*, closely allied to aluminum, occur so very rarely as not to demand a notice.

This closes what is considered necessary to be said in explanation of the properties of the *light metals*, which constitute the bases of the *alkalies proper*, the *alkaline earths*, and the *earths proper*. A few remarks in relation to each of these classes, however, by way of retrospect, will be useful to the reader.

Of all bodies, the *alkaline metals*, potassium and sodium, have the greatest affinity

for oxygen; and their oxyds, potash and soda, are the most powerful *bases*, with which other elements unite to form compounds. Ammonia is also classed with the alkalies. These three alkalies are easily soluble in water, exert a strong caustic action on animal and vegetable substances, and have a great affinity for carbonic acid, which they absorb eagerly from the atmosphere, thereby becoming converted into alkaline carbonates. The carbonic acid in combination with these alkalies, cannot be expelled by heating, but it escapes immediately with effervescence on the addition of other acids. These carbonates are also easily *soluble* in water, and have a basic reaction. Potash and soda, combined with sand at a high temperature, yield melted *glass;* and when dissolved in water and mixed with fat, on being boiled together they yield *soap*. Most of the salts which the alkalies form with acids, are soluble in water, and thus the moisture in soils affords them the opportunity of performing their part in the chemical preparation of the food of plants.

The metals of the *alkaline earths*, calcium, magnesium, etc., have also such a very strong affinity for oxygen, that the preparation of them is very difficult. The oxyds of these metals, lime, magnesia, etc., though alkaline, are called *alkaline earths*, because they are *sparingly soluble*, while alkalies are *easily soluble*. They are also less caustic than the alkalies, and, like them, eagerly absorb carbonic acid from the air and form *carbonates* which are solid, and *insoluble* in water, while the carbonates of the alkalies are *easily soluble*. The carbonates of the *alkaline earths*, on the other hand, lose their carbonic acid by exposure to a powerful heat, while the *alkalies* do not.

The *earths*, alumini, etc., unlike the *alkalies* and *alkaline earths*, are entirely *insoluble* in water, which they absorb largely like a sponge. But alumina, it has generally been supposed, does not combine chemically with carbonic acid, but only absorbs it freely, as it does water, and retains both as agents to aid in the preparation of the other elements in the soil as food for plants. A part of the carbon of plants is now supposed to be derived from the soil, though their whole supply of this element had long been considered as derived from the atmosphere.

Iron and Manganese.—Of the *heavy metals*, these two only need be noticed, as they alone, of this class, enter into the composition of the common vegetables cultivated by the farmer.

The extent to which *iron* is appropriated in the growth of animals and vegetables can be seen in the Tables. Being always present in quantities larger and smaller, in the rocks, and entering into combination with any of the elements of the soils, the agriculturist need have little fear that his lands may become deficient in this element.

Iron combines with oxygen, carbon, chlorine, sulphur, phosphorus, cyanogen, potash, acetic acid, etc.

Manganese, in some of its forms of combination with oxygen or chlorine, enters sparingly into the composition of minerals and vegetables. It is never found as a metal in nature, but may be produced from its black oxyd by a high heat with charcoal.

SCIENTIFIC AGRICULTURE.

How many curious questions are suggested by such observations as the following. Some varieties of wheat are better suited for the pastry-cook, others for the baker of bread. Some samples of barley refuse to *melt* in the hands of the brewer and distiller; and some yield more brandy; while others lay on more fat. The Scottish plowman refuses bog oats for his *bruise-meal*, or for his oaten-cake, because they make it tough; and the cotter's family prefer Angus oats for their porridge-meal, because they swell, and become bulky and consistent in the pot, and go further in feeding children at the same cost. The pea sometimes refuses to boil soft; and potatoes, on some soils and with some manures, persist in growing waxy. Swedish turnips sell for thirty shillings a ton—as in large towns they often do—yellow turnips will bring only about twenty-five, and white globes, eighteen; while all the varieties cease to *feed well* as soon as a second growth commences.

What is the cause of such differences as these? How do they arise? Can they be controlled? Can we by cultivation remove them? Can we raise produce of this or that quality at our pleasure?

Such questions, constantly arising, have led to extended analyses of the food consumed both by cattle and by man; and from these analyses—still far from being complete—most curious, and most interesting, and most practically important results have been obtained. Let us glance at some of the partial generalizations which have been arrived at, and which may be *provisionally* adopted, by practical men.

We have already seen that all vegetable productions contain from ninety to ninety-eight per cent. of combustible or organic matter. Now, this organic part has been found, in all cases, to contain three different classes of substances:

First, the *starch* class, which compre-

hends starch, gum, and sugar, and certain other substances of a similar kind.

Second, the *fatty* class, whicn comprehends solid and liquid oils of various kinds, of which the oils extracted from nuts and seeds are familiar examples.

Third, the *gluten* class, which comprehends the gluten* of wheat, vegetable albumen, vegetable casein, and some other analogous substances, the distinctive characters of which have not as yet been thoroughly investigated.

These several classes of substances are always to be found in sensible quantity in all our cultivated crops; but their proportions vary in different plants, in different parts of the same plant, and in the same part when the plants are grown in different climates, on unlike soils, or by the aid of different manures. Hence the occasional differences in the sensible qualities of the same vegetable, under different circumstances—the waxiness of the potato, the hardness of the pea, and the stubbornness of the barley—become intelligible. The several organic constituents of the grain and root crops are present in unlike proportions, and necessarily give rise to unlike qualities.

But their unlike effects, in the feeding of animals, suggested a farther train of investigation. The parts of animals known to be differently built up, or with different degrees of rapidity and success, by these different varieties of vegetable produce;—of what, then, do the parts of animals themselves consist? The answer to this question throws a new and beautiful light upon our path, clearing up obscure points on the way we have already trodden, and pointing out new tracks, which it will prove interesting hereafter still farther to explore.

All animal substances—the flesh, bones, and milk, of all living creatures—consist, like the soil and the plant, of a combustible and an incombustible part. In dry muscle and blood, the incombustible or inorganic part does not exceed two per cent.; and in milk evaporated to dryness, seven per cent.; while in dry bone it amounts to about sixty-six per cent. of the whole weight.

The combustible or organic part consists of fibrin—the fibrous part of lean meat is so called—and of fat. And rigorous analysis appears to show, that this fibrin is almost identical in constitution with the pure gluten of wheat; while the fat of some animals at least, is absolutely identical with the fatty oils contained in certain vegetable productions.

The incombustible part, again, consists of soluble saline substances, and of an insoluble earthy matter, the *earth of bones*. These two classes of inorganic substances exist also in the ash of all plants, though in variable proportions. The stems and leaves abound more in soluble saline matter, the seeds in bone-earth and other phosphates.

These things being discovered, the uses of the several constituents of the food became in some degree manifest. The fat of the animal was derived directly from the fat of the vegetables on which it lived—its muscular fibre directly from the gluten of its food—and the salts of its blood, and the earth of its bones, from the inorganic matters contained in the ash of the plants on which it fed. The plant produces the raw materials, the fat and gluten—the bricks and stones as it were—with which the animal, having received them into its stomach, proceeded directly to build up its several parts.

And as the proportion of the fatty matter was greater in some vegetables than in others, some kinds of food would enable the animal to lay on more fat, or to produce more butter. Others, again, in which the gluten abounded, would favor the growth of muscle, or the production of cheese; while those of which the ash was richest in bone-earth, would enlarge and more rapidly increase the bones of growing animals. In so far, also, as the composition of the food was known to be modified by the soil on which it grew, so far might the fattening or growth of stock be considered as directly dependent upon the quality of the land on which they lived, or were fed; and in so far as the application of this or that manure was known to affect the quantity of gluten or fat in the crop, in so far would it be in our power, by varying our manures, to control the ordinary operations of nature, and to raise varieties of produce, fitted especially for this purpose or for that. These deductions opened up a wide field for experiments, both in the practical raising of varieties of food, and in the practical feeding of stock; upon which many zealous cultivators have already entered, and which, if they cultivate it with perseverance and accuracy, they are sure to cultivate with success.

How beautiful is the connection thus established between the dead earth, the living plant, and the reasoning animal! The life and growth of the animal are dependent

* When wheaten flour is made into dough with water, and this dough is washed with a stream of water upon a sieve, as long as the water passes through milky, a tenacious substance, like bird-lime, remains behind. This is the gluten of wheat. Albumen is the name given by chemists to the white of the egg; and casein, that applied to the curd of milk. Of both of these latter, an appreciable quantity is found in almost every kind of vegetable food.

upon what it receives from the plant, those of the plant on what it receives from the soil on which it grows. The plant does not always produce, in equal quantity, those substances which the animal requires. It is dependent upon the nature of the soil, even for the proportions of gluten, or of fat, which it is capable of yielding to the wants of the animal; while the inorganic parts of its substance is wholly drawn from the spot of earth on which it happens to be placed. It strikes us at first as a curious circumstance, that all vegetable food should contain bone-earth and common salt in some small proportion, and that useful plants should refuse to grow in a healthy manner where these substances are not present in the soil. But this arrangement appears absolutely beautiful when we learn, that without those substances the animal cannot live. The main purpose served by the vegetable is to feed the animal races. This they could not do, if they did not contain all that animals require to form the several parts of their bodies; their bones and blood, as well as their muscles and their fat. Thus the soil imparts to the plant only what is the special duty of the plant to impart to the animal. Hence the machinery of life—of life animal, as well as of life vegetable—must equally cease to move, if the soil be deficient in any of its necessary ingredients. How much, therefore, both of the direct or cropping, and of the indirect or manufacturing branches of rural economy, depends upon the chemistry of the soil!—*Edinburg Review.*

Utility of Fruits for Food and the Preservation of Health.

The fruits of various countries and climes should be regarded as one of the most valuable gifts which divine Providence has bestowed upon man. And the cultivation of those of superior kind should on all accounts be promoted,—not merely as the source of luxury, but as a substitute for pernicious medicine, and as a delicious, healthy, and most nutritious article of food, which, habitually used, palliate thirst, thus essentially promoting the great cause of temperance. "The palate," says the celebrated Mr. Knight, "which relishes fruit, is seldom pleased with strong fermented liquors; and as feeble causes, continually acting, ultimately produce extensive effects, the supplying the public with fruit at a cheap rate, would have a tendency to operate favorably, both on the physical and moral health of the people."

The belief is but too prevalent, that fruits produce diseases during the months of summer and autumn, and especially the dysentery. The belief is untrue; and the very reverse is certainly true, fruits being the true preventives of disease. I might amplify on this subject, but must be brief, and will only add as proofs, and from celebrated physicians, the following from the "Annales d'Horticulture," due to the researches of Gen. Dearborn and the New England Farmer, where I have found them inserted. It is from the writer of another country—a country celebrated for the cultivation of good fruit, and alike celebrated for the remarkably temperate habits of its people. "One of the best aliments, and the best appropriated to the different ages of life, is that which fruits afford. They present to a man a light nourishment, of easy digestion, and produce a chyle admirably adapted to the functions of the human body. * * *

"There are fruits, which, when perfectly ripe, can be eaten even to excess without inconvenience, such as grapes, cherries, and currants; the other kinds never occasion ill consequences, if they are eaten only to satisfy the demands of nature. * *

"Thoroughly ripe fruit, eaten with bread, is the most innocent of aliments, and will even insure health and strength.

"In traversing the territories of Germany, there is to be seen near each habitation a vineyard or a garden of fruit trees. The villages are surrounded with them, and there are few families who do not make use of fruits during the summer, and preserve a certain quantity for winter. The surplus is sold in the cities. There are to be seen upon the Rhine, and other rivers of Germany, boats laden with dried apples, pears and plums." * * *

The following, from the same writer, is from a passage to be found in "*Advice to people upon their Health,*" by Tissot:

"There is a prenicious prejudice, with which all are too generally imbued; it is that fruits are injurious in the dysentery, and that they produce and increase it. There is not, perhaps, a more false prejudice.

"Bad fruits, and those which have been imperfectly ripened, in unfavororable seasons, may occasion colics, and sometimes diarrhœa, but never epidemic dysentery. Ripe fruits of all kinds, especially in the summer, are the true preservatives against this malady. The greatest injury they can do, is in dissolving the humors, and particularly the bile, of which they are true solvents, and occasion a diarrhœa. But even this diarrhœa is a protection against the dysentery. * * *

"Whenever the dysentery has prevailed, I have eaten less animal food, and more fruit, and have never had the slightest at-

tack. Several physicians have adopted the same regimen.

"I have seen eleven patients in the same house; nine were obedient to the directions given, and ate fruit, they recovered. The grandmother, and a child she was most partial to, died. She prescribed burnt wine, [*burnt brandy, or high wine!*] oil, powerful aromatics, and forbade the use of fruit; it died. She followed the same course, and met the like fate.

"This disease was destroying a Swiss regiment, which was stationed in garrison, in the southern part of France. The captain purchased the grapes of several acres of vines. The sick soldiers were either carried to the vineyard, or were supplied from it, if they were too feeble to be removed. They ate nothing else; not another died,—nor were any more attacked with the complaint after they commenced eating grapes.

"A minister was attacked with the dysentery, and the medicines which were administered gave no relief; he saw by accident some red currants, and had a desire to eat them; he ate three pounds between seven o'clock in the morning and nine o'clock in the evening; he was better during the day, and entirely cured the next."

I might multiply the facts and evidences from different sources, and the writings of other eminent physicians; but the above must suffice for this time and place.

In new countries, and in new settlements, —in places remote, in the wilderness or on the ocean,—in times of privation, and in the absence of useful fruits, the habitual use of tobacco, of alcohol, and of strong fermented liquors, has been acquired, all of which create insatiate thirst. The friends of temperance, who would abolish the use of these, as pernicious, must encourage the cultivation of fruits, as a healthy antidote and useful substitute.—*Kenrick's Am. Orchardist.*

Book Farming.—It is an old saying, which has been handed down from father to son, that "books and learning never make farmers." We would ask those, who have an aversion to "book farming," to read the remarks of Judge Buel, which no doubt are familiar to most of our readers, and which he made only a few weeks before his death: "Bred to a mechanical business, I took up agriculture more than twenty years ago, as the future business of my life; without the pretensions or conceits which we are all apt to acquire in the long practice of business, I began farming with a cosciousness that I had everything to learn; and that the eyes of my neighbors would be quick to detect faults in my practice. I at once sought to acquire, therefore, a knowledge of the principles of my business, and of the practice of the most enlightened and successful farmers. These I found in books and agricultural periodicals, and by these I have been greatly benefited. Although it does not become me to herald my success, I will venture to say, to encourage others, and particularly the young, in the work of self-instruction and improvement, that my lands, which are light and sandy, and which cost in an uncultivated state thirty dollars an acre for farming purposes; or, in other words, that the net profits of their culture exceed the interest of two hundred dollars an acre."

Prevention of Drouth.—The subject of the best means of preventing crops from suffering from drouth was discussed at a late meeting of the Farmers' Club of the American Institute. Professor Mapes made a brief and excellent adress. He said that the deposition of moisture upon the surface of bodies colder than the atmosphere was an acknowledged evidence of existence of moisture in the atmosphere. The fact of a want of moisture in the soil was a sure evidence that there was a superabundance in the atmosphere. Wherever the soils are disintegrated to a sufficient depth, they will be found to be colder than the supernatant atmosphere. When the atmosphere circulates in a free soil, it will deposit moisture in every particle of earth colder than the air. This process, too, was eminently beneficial in another way. It was well known that during the first part of a shower, rain was more beneficial than in the last part, as the ammonia accumulated in the atmosphere, and which was necessary to vegetation, was carried into the ground. During a drouth, the quantities of ammonia and similar elements were much accumulated, and with the atmosphere a greater amount of these additional elements were deposited. The true means, then, of adverting the ill-effects of a drouth, were subsoil plowing, deep plowing, and underdraining. On his farm, not a single plant has suffered from the drouth, while nearly all the neighboring farmers had suffered to a greater or less extent. He attributed this result solely to the system of subsoil, plowing and under-draining he had pursued.

Cost of Importing Stock.—The cost of importing stock from Great Britain to this country by steamer, including commission, insurance, keep on board and freight, is, for a horse, $205; for a cow, $250. By a sailing vessel it would be from $50 to $75 less.—[*Louisville Journal.*

Remarks on the Fungi.

BY DR. G. W. L. BICKLEY.

The importance of *fungi* as a part of the vegetable kingdom has not been generally recognized. Few persons, except professed botanists, scarcely ever give the subject a thought. The fungi tribe includes mushrooms, puff-balls, blight, mildew and mould; and in simplicity of structure correspond with the *lichens* and *algœ*; yet they are essentially different in the character of their fabric, and in habits. Unlike most algœ and lichens, they do not thrive upon the materials consumed by them, but always require for their food, decaying animal or vegetable matter. They require, also, for their perfect development, situations which are deprived to a considerable extent of light, and the air of which is saturated with moisture, as well as possessing an elevated temperature, which, however, results from the saturated condition of the atmosphere.

Fungi appear with considerable constancy on certain substances—i. e. particular kinds of substances produce certain kinds of fungi. Almost all kinds of plants have their particular kinds of blight. A species of mould is found only on the dung of cats; while the common edible mushroom is always produced exclusively upon what is termed mushroom spawn— a manure composed of various decaying substances.

The universal occurrence of the simpler kinds of fungi upon all spots favorable to their development has led many to suppose that they were produced spontaneously by the decomposing substances.

It is useless, however, to attempt to account for this development by such a mode of reasoning; for the extraordinary means adopted by nature for the production as well as the distribution of their germs, suffices to explain the phenomenon. Fungi are of but short duration, since the tissue is soft, often containing so little solid matter as almost to melt away when broken down; and does not at any time possess firmness. In the algœ, the development of the individual takes place so rapidly that fructification is very often imperceptible. But in the fungi, on the contrary, we see all the energies of the plant directed to the production of germs of new ones. The parent plant may not attain great extent, but the multiplication of the germs is very considerable. The fine dust escaping from the puff-ball when ripe consists entirely of these small bodies diffused through the air subject to the currents of wind, and ready to develope themselves when brought in contact with proper conditions. About ten millions of these minute germs have been counted in a single fungus.

It is easy to perceive that when these minute particles are diffused through the air, very few places can be excluded from their contact.

At first view it seems a little strange that the air we breathe should contain the germs of a large number of fungi ready to develope themselves whenever they shall meet with the peculiar conditions requisite for such a purpose. A knowledge of this fact, i. e. the universal diffusion of these atomic germs through the air, is of practical importance in enabling us to exclude them from substances we wish to preserve uninjured for any considerable length of time. It is a well-known fact that preserved fruits are exceedingly liable to become moulded in consequence of the deposit of these minute germs upon their surface; and no care which can be employed will prevent their introduction into the jars containing the preserved fruits. There is a kind of cheese much valued by epicurians in consequence of its peculiar flavor, which is derived from the fungus vegetation it contains. This cheese is prepared by breaking up the curd into small lumps and spreading it upon a cloth exposed to the sun and air. While thus exposed, the germs fall upon it, and afterwards vegetate and spread themselves through the entire mass while it is yet soft.

The fungi, in the instances noticed, receive their nutriment from organic matter already decaying, or which will rapidly decompose. There can be little doubt that their development hastens decay where it was in the first instance slow, or it may even induce it where none previously existed.

That such is a fact seems to be abundantly proven by the circumstance that preserved fruit not infested with mould will remain sound for a great number of years, but should the mould form upon it, its development would produce rapidly such chemical changes that decomposition would speedily ensue. There remains still a more remarkable group of fungi, which is seen to develope itself in the midst of the tissues of living plants and animals; a good example of which is the rust and smut of corn.

The germs of this class of fungi are, perhaps, inhaled from the atmosphere through the stomata or breathing pores, and also they may, by being mixed with the water percolating the soil, be imbibed along with the fluid which is absorbed by the rootlets. But if they are taken to the vegetable tissue by absorption through the rootlets, they must be inconceivably small, since the intercellular spaces of that part of the plant are so small as to prevent the introduction of atoms of any considerable size.

Animals are also liable to the growth of fungi within their bodies. In the West Indies a kind of a wasp is seen flying about having plants as long as themselves projecting from some part of the surface, the germs of which were originally introduced through the breathing pores on their sides. In the course of development, however, the insect is destroyed by the plant, which now receives the nourishment of the decomposing animal body, and developes itself with more rapidity than during the life of the insect. The silk worm is also troubled with a disease termed muscardine, about the time it enters the chrysalis state, which is now known to arise from the growth of a minute vegetable of the fungus tribe.—The germs, when introduced into the body of one individual, may be communicated to another by contact with the diseased part. It propagates itself by the extension of its own structure, always occasioning the death of the silk-worm. Unlike the West India wasp, the plant does not exhibit itself externally until after the death of the worm.

Another example of fungus vegetation is seen in the process of fermentation. Upon examining with the microscope a mass of yeast, it is found to consist of a number of very small disconnected vesicles, constituting the simplest form of vegetation. A strange circumstance in respect to these vesicles is that they possess the power of retaining their vitality for an indefinite period, or until the proper conditions are presented for their development. Even the exposure to such extremes of temperature as the boiling point of water, and 76 degrees below zero, do not seem to affect their vitality, for as soon as placed in a fluid containing sugar in solution, they commence vegetating actively, and the decomposition which they effect in the fluid constitutes fermentation. If examined during this stage with a powerful microscope, it will be observed that little buds are put forth from each vesicle, which in time becomes vesicles like their parents, capable of developing other buds which mature and develope other vesicles, so that in a few hours they are found to be in rows of four, five or six. The sides, also, sometimes burst and eject a number of minute granules which soon develope themselves into additional cells.

Of all the cryptogamia, or non-flowering plants, the fungi are, perhaps, the most important to man, notwithstanding the fact that at first view their influence would seem to be executed rather to his injury than to his benefit. Blight, mildew, rust, etc., often destroy immense quantities of the fruits of the earth, upon which man relies mostly for his support. Animals administering to his luxuries, are also destroyed from like causes. The decay of timber by dry-rot is also caused by fungus vegetation. Instances are on record where the dry rot was so rapid in the timbers of dwelling-houses, and so surely transmitted to other timbers with which the houses were repaired, and to books, furniture, etc., that the inmates have been compelled to give up their residence and seek new abodes in consequence of the rapid development of vegetable fungi.

The power possessed by these plants, notwithstanding the softness of their tissues, is truly astonishing. In illustration, I will mention a curious circumstance occurring in Bassingstroke, some years ago. The streets were paved, but in a few months the pavement exhibited an unevenness which could not be easily accounted for. It was not long, however, before the mystery was explained, for some of the heaviest stones were lifted out of their beds by the growth of large toad-stools beneath them.

Some of these stones which were raised so as to make a re-paving of the town necessary, measured twenty-two inches by twenty one, and weighed eighty three pounds. The resistance offered by mortar which held these stones in their places would likely afford even a greater obstacle to the elevation of the stones, so that we might say with some show of truth, that toad-stools enough might grow under the soles of a man's feet to elevate him in the air.

Notwithstanding these instances in which fungi operate to man's injury, their benefits far outweigh their occasional devastations. They are not only serviceable to man, but to the whole animal kingdom.—Fungi may properly be termed, as they often have been, the scavingers of nature, laboring incessantly to clean up from the surface of the earth decaying substances, which, if left undisturbed would prove seriously injurious to man's health. The minute germs float about in the atmosphere inactive and undeveloped, until either decaying animal or vegetable matter is exposed, when they readily cover it, and rap-

idly developed themselves in the fungi of various kinds. The rapidity with which this class of vegetables develop themselves, is one of the most remarkable phenomena of nature. One species of fungus has been known to grow from an inconceivable minute germ, to a mass weighing thirty-four pounds, in the short space of six weeks; and even one hundred pounds is not an unusual weight for this clas of fungi: a large fungus of the puff ball kind, has been known to grow in a single night, from a minute speck to the size of a large gourd. These powers of growth are not equalled by any other class of living beings known upon the face of the earth. In chemical composition, fungi more nearly resemble animal flesh, than any other vegetable substance known, and those kinds which are destitute of poisonous properties, are most admired by the epicure; some of the fungi are valuable in the hands of the physician. One of the best stiptics for arresting the flow of blood, is a fungous vegetable, much resembling the puff ball, which also possesses similar properties. There is another kind found in Asia, much used for producing, even in a dry state, a curious kind of intoxication, of which the Tartars are exceedingly fond. From these remarks it will be readily perceived that men are too apt, at first view, to pronounce some plants entirely destitute of serving any useful purpose, tending to man's benefit or advantage; but the enlightened philosopher, in taking a general view of the relations which one part of nature bears to another, will always see, with peculiar satisfaction, that no part constituting a division of the vast domain of creation has been brought into existence without some wise and definite purpose.

These remarks naturally lead the contemplative mind, after having perused the foregoing pages, into the relation which the vegetable kingdom bears to the animal, and the institution of an inquiry whether there has been any positive design manifested by the Great Architect of nature, in adapting this portion of his handiwork to the wants and circumstances surrounding man. In considering the mutual relations which exist between vegetables and animals, we find that these two great organized kingdoms of the creation, by the infinite intelligence of an infinite God, have been made to co-operate in the execution of the same design; so that a due balance in the constitution of the atmosphere shall be preserved, in order that every class of beings which inhabit the globe on which we live, may be placed under the proper conditions to insure the perfect development and health of their systems. As before stated, two principles of atmospheric air, are oxygen and carbon; oxygen is essential to animal life, while carbon is obnoxious to it. But, on the contrary, carbon is indispensable to the existence of vegetable organization, while oxygen is deleterious. Now here are conditions diametrically opposite, which are to be equalized and adapted one to the other, so that no one part of nature shall, by serving to develop one part, aid in the destruction of another. In other words, plants and animals must live and breathe in the same atmosphere, composed of elements deleterious to the existence ot plants as well as animals, if these elements be so separated, or exist in such proportions that a due supply of both is not kept up in the atmosphere; and the contemplation of the adaptation of these two kingdoms of creation cannot fail to impress upon the most obtuse mind, evidences of design, and beauty of adaptation, not observed in any other department of nature.

I shall endeavor to explain how these apparently hostile conditions are reconciled to each other, so that no want of harmony can be observed in the workings of the mighty inscrutable Ruler of the universe. In animal existence, the function of respiration is that process by which the blood, received into its vessels from the alimentary canal, is kept in a state of absolute purity during its subsequent circulation.—This object is effected by bringing it at short intervals into close proximity either with atmospheric air, or with water containing this air diffused through it. When this mutual action of the blood and air upon each other is continued without interruption, the blood is purified, and changed from a dingy purple to a bright scarlet color, while, on the contrary, the air is rendered impure and unsuited to support respiration or combustion. Now, it matters little whether the aerating organs be the lungs of a man or the gills of a fish, the object of nature is the same, i. e. to oppose a large surface to the contact of air. This object is accomplished by the division of these organs into innumerable cells, or by their extension on the walls of cavities in the surface of pectinated ridges. The blood having arrived in these organs is distributed to their terminating branches; even though it is still retained in vessels, it is easily acted upon by the air on the exterior. It is almost impossible to determine by direct observation the nature of the changes which the blood undergoes while passing through the lungs. The most obvious change is that of color. The chemical differences found in the veins before it has reached the lungs, and the bright scarlet it exhibits in the arteries after it has circulated through them, may be best understood

by considering the changes wronght in the air itself. It is well known that air consists of certain principles in definite proportions. Now, after it has acted upon the blood and is returned from the lungs, a portion of its oxygen has disappeared, and this loss of oxygen is fully supplied by an addition of carbonic-acid gas and watery vapor.

Now, by continuing to remember that the air which comes in contact with the blood of animals, receives in its place carbonic-acid gas, we may properly examine the process of aeration occurring in vegetables. I have previously stated that carbonic-acid gas was obnoxious to animal life; and as animals in the process of respiration draw by every inhalation certain proportions of oxygen from the air, and replace the loss by a proportionate amount of carbonic-acid gas, it follows that some provision should have been made by the Creator for the removal of this poisonous gas from the atmosphere, otherwise animal existence might long since have become extinct, in consequence of the exercise of a function which was positively necessary to their existence. It has been already shown that carbonic acid gas, is positively necessary to the maintenance of vegetable life; and, hence, we see at once that animals are made to generate this principle for the nutrition of plants, and it is thus removed from the air so constantly that there does not accumulate a sufficiency, at any time, to prove injurious to animal existence. I have already shown that the leaves of plants are analagous to the lungs of animals, and that in the leaves takes place the decomposition of the carbonic gas, which is absorbed from the air. When exposed to the action of the sun, plants decompose carbonic-acid gas, retain its carbon and disengage its oxygen. And in this respect, we have two processes diametrically opposite, neither one of which, however, could be dispensed with without tending to the serious injury of the other, and yet both are positively necessary to the maintenance of animal and vegetable life. In one of these cases, the effect of respiration, or the inhalation of the same menstrua, adds carbon to the vegetable fabric, while the other has the circulating fluid, upon which the healthy organism of the animal depends, supplied with a due quantity of oxygen necessary to its purification, and the exhalation of carbonic-acid gas, which is necessary to the support of vegetable life, resulting from the chemical effects or separation produced upon the constituents of the air by the action of the blood and animal tissues. It is, therefore, easily understood that the atmosphere surrounding the blood is constantly receiving from the vegetable kingdom a large accession of oxygen, and is at the same time freed from an equal amount of carbonic-acid gas, both of which effects tend to purify and fit it for the respiration of animals.

It is unnecessary that I here again refer to the manifest design which has been exibited by the Creator, in the adaptation of the organs of plants to secure their reproduction. But it may not be improper to remark that there is scarcely a vegetable production found upon the face of the globe, on which some kind of animal does not subsist.

And wherever a plant is found, there is also found the animal which subsists upon it. It is upon this principle that we are to account for the fact that partridges are found on plains, wood-cocks in forests, grouse on moors, and the ptarmigan on the loftiest peaks of mountains.

This idea might be traced out, affording a confirmation to a previous statement, that for every disease of a given locality, nature furnishes from her storehouse the proper remedy. Both vegetables and animals are adapted to varieties of climate and temperature; and upon observation, we shall readily perceive that those plants most essential to the maintenance of man, bear a variety of climate better than those less adapted to his wants. Warm climates are more favorable to vegetable growth than cold ones. In Spitzbergen, the number of plants having conspicuous flowers, does not exceed thirty species; while on the island of Cuba alone, more than five thousand species have been noticed by botanists. Here we find external nature admirably adapted to the internal wants of man; or, in other words, we find the distribution of vegetables to correspond to the wants of animals.

Man, in the warm climates, requires a vegetable diet, and there we find this kind of food most abundant. The people of northern regions require that kind of food which produces the greatest heat during digestion, such as fish, oil, and flesh. And there we find only a very scanty proportion of vegetation.

The frigid zone contains but few plants; and the verdure of those countries embraced within the polar circle, are mostly confined to hills having a southern aspect, the trees upon which are of a very diminutive growth. The vegetation of the torrid zone is characterized by a variety and magnificence found on no other part of the globe. Thus we find that the animal and vegetable kingdoms have certain relations to each other, showing that the proper development of the one depends upon the health and

growth of the other; and in viewing the relations which exist between minerals, vegetables, animals, man, and man's mentality, we cannot fail to perceive certain existing circumstances linking one to the other, and rendering each dependent upon the other for its existence, that must at once strike the most obtuse mind as undeniable evidences of design.

Malaga Raisin Vineyards.

At daybreak this morning, a gentleman, whom Mr. Kirkpatrick requested to show me his vineyard, and explain the process of preserving grapes, waited upon me, and we set out immediately. Our road lay along the shore to the eastward, the vineyard of Don Salvador Solier lying in that direction, at the distance of about fourteen miles. In the immediate vicinity of Malaga, the country is extremely rugged, but every patch where it was possible to thrust in a plant was under cultivation. The rocks consisted of rugged masses of limestone, alternating with the same kind of slaty schist I had previously observed on the road from Antequera. For the first two leagues, there were few vineyards, chiefly owing to the ruggedness of the country, which would not admit of cultivation. Beyond that distance almost every hill was covered with vines, the produce of which is all converted into raisins. The grapes are all of the large white Muscatel—the Muscatel Gordo Roxas Clemente. This grape, my companion informed me, does not succeed in the interior, and, therefore, all the muscatel raisins are made within two leagues of the coast. The Lexia raisins, which are used for puddings, etc., are made in the interior. We arrived at the country house of Don Salvador at nine o'clock, and after a substantial breakfast, sallied out to examine the vines. Six or seven workmen were employed in preparing the ground for planting, within a short distance of the house. They did not trench the whole of the ground, but dug out square holes, about two feet in diameter and not more than twenty inches in depth. The distance of the centers of these holes from each other is seven feet, and this is the distance at which the vines on the hills round Malaga seem invariably to be planted. The vineyards I was examining, as well as all those in its vicinity, consisted of a series of steep hills. The soil everywhere was a decomposed slate, mixed with abundance of gravel of the same substance. On the higher part of the ground, this soil appeared rather hard and required great labour to break it up, but once broken up it is loose forever; so much so that it slides away from under the feet even where there is only a slight slope. There is no difference made in the distance at which the vines are planted, between the hills and the valleys; although in many places on the former the shoots scarcely extend more than ten or twelve inches, while in the valleys they extend to the length of as many feet They never, under any circumstances, manure these vineyards; they say it would give more wood but would not add to the quantity of the fruit. The branches are pruned closer to the stock than those of any vines I ever saw; nothing but the half-formed buds, at the junction of the old and new wood, being left to produce the wood of the succeeding year. I could not find an instance where the spur had been left long enough to include the first full-formed bud, which is generally from half an inch to an inch from the junction. The number of shoots seemed almost unlimited; I counted from ten to twenty-two; there was scarsely any vine had fewer than ten, and they generally had from twelve to fifteen. The stock was close to the ground, and not the slightest effort made to raise the shoots, or support them from the ground. Almost every bunch would, therfore, lie on the ground, and were the soil of a less gravelly description, the greater part would, without doubt, be lost. After the pruning they dig over the ground and lay bare the stock, in order to scrape off the barbe, or small thread-like roots which are near the surface. As scarcely any grass or herb vegetates among these vines, and the soil is always sufficiently loose, it is evident that they require little digging or cleaning. We went out to visit a peasant, a neighbor of Don Salvador's. He said four or five very fine vines might yield raisins enough to fill a box which contains an arroba of twenty-five pounds; but throughout the contry it would require, on an average, nine or ten. The grapes lose about two-thirds of their weight in drying; this would, therefore, give a produce of seven or eight pounds of grapes to each vine—a calculation which I should think must include a much greater proportion of stinted vines than of luxuriant ones; for the majority of those in Don Salvador's vineyard would, I have no doubt, yield double that quantity. Including, however, those vines which are visible at the tops even of the highest hills, the calculation is likely enough to be correct. The grapes, when dried, are worth double what they would yield made into wine, unless spoiled by the rain.

They usually commence gathering the grapes about the middle of August, choos-

ing only such bunches as are ripe. They return after a week or two to make another selection, and so on for a third and fourth time. A place is always reserved in the vineyard, free from plants, on which to spread the grapes when gathered; and they choose a spot where the soil is of the darkest color, in order to its keeping the full force of the suns rays during the day, and retaining the heat during the night. The bunches are spread out separately on the ground, and never allowed to press upon each other; according to Don Salvador, they are only once turned over. At the end of fifteen days they are, in general, sufficiently dry. This season was more unfortunate for the early commencement of the rains, than any season for many years, and the crop was remarkably fine. It is Don Salvador's intention in future years, to have wooden toldos, or awnings, prepared to shelter the grapes, whilst drying, against the rains, and also to cover them during the night. He says that the drying of the grapes is so much retarded by their being exposed to the dews during the night, that when he has the means of covering them at night, he expects they will be dried in half the time usual at present. Before the bunches are spread out, the small grapes are picked out, as well as any which may happen to be injured; the small grapes are dried separately. I saw a heap of them in Don Salvador's house, which had the appearance of very large currants. When the grapes are turned, any spoiled ones are, or ought to be picked out; they have no particular rule for judging when they are sufficiently dry—it is learnt by experience. When they happen to get rain while drying, the stalks become black or rusty looking, instead of being of a bright light brown. According to Don Salvador, the district which produces the Muscatel grape extends only two leagues farther east, that is, not more than three leagues in all, along the coast, and two leagues inwards. He says the value of the land planted with it is about 3,000 rials, or 150 Spanish dollars per fanega—*Busby's vineyards of France and Spain.*

☞ President Wilder's Pomological Levee to the members of the American Pomological Society, at the Revere House last evening, was quite a pleasant affair. The Hon. Emory Washburn, Hon. Robert C. Winthrop, Hon. N. P. Banks, Jr., Hon. Benjamin Seaver, were among the distinguished men of our state who were present. After the company—which numbered about one hundred and fifty—had partaken of the splendid repast, Mr. Wilder made a brief address, and gave utterance to the pleasure which this visit of the members of the American Pomological Society afforded him. He said it was not his purpose to call upon his friends for formal speeches, nor to summon "spirits from the vasty deep"—nor to invoke the presence of the "rapping spirits"—nor should he, in these days of temperance and of the Maine Law, offer "ardent spirits;" but it was his purpose to place before the guests a specimen of American fruit—the berry and the juice.

For some rich specimens of the juice of the grape, he expressed his indebtedness to generous friends in Ohio, who desired to have it tasted and tested by the members of the Pomological Society. And for the purpose of tasting and testing this Ohio vintage, Mr. Wilder proposed that the company resolve itself into a "Tasting Committee of the Whole" upon the Ohio vintage, and he would propose—

The vintners of Ohio—By never allowing the juice of the grape to be distilled or adulterated, may they prove to the true promoters of temperance that it can produce joy without sorrow, and health without detriment to the public weal.

This sentiment was followed with a general report from bottles of Longworth's sparkling Catawba, Work's Isabella Wine, and American Hock.

Mr. Wilder gave:

Massachusetts—The good seed planted by our Puritan forefathers more than two centuries ago, has borne fruit for her children in every succeeding generation.

Gov. Washburn responded:—"I feel myself honored in being permitted to be present here this evening at this hospitable board. I am aware that I owe it to the circumstance that I have been honored with that post to which you have alluded, and I feel myself honored that I may welcome those who have honored you and the state by being here to-night. (Cheers.) I wish I could say something that might be suited to the sparkling of that beverage here before us. We have nothing of the kind here in Massachusetts. I was impressed this evening with the consideration of what a pleasant affair it would be if we only understood each other in the different parts of the United States—if we could meet at hospitable boards as friends instead of being always engaged in angry discussions; and if we could feel that we have a common country, the rich fruits of which we are here to enjoy. Let me say that there is no spot on God's earth where the people, the whole people, the common people—the high and the low—enjoy so much of the fruits of the earth as we do in

America. (Applause.) In Europe the rich only enjoy the luxury of a peach, a pear, or an apple. The truth is, the people there are obliged to devote the entire soil to that which will support life."

The Governor pursued this point a little further, and concluded by giving a sentiment in honor of Mr. Wilder, the host.

Mayor Smith was called out, and gave a felicitous account of his travels in Asia, and compared it with our country—reserving for the latter the high praise of being the first among the nations of the earth.

Apt speeches were made by ex-Mayor Seaver, Mr. Benson, of Maine, Mr. Prince and Mr. Barry of New York. Mr. Walker, W. S. King, Mr. S. Sprague, Mr. E. L. Keyes, J. W. Proctor, of Massachusetts, and others.

It is hoped that full and authentic accounts of the Pomological meeting will be received and presented in the ensuing number of the Review.—Ed.

The Chinese Primrose.

The single white and pink varieties ripen seeds in abundance, which afford a ready means of increasing them; and as the fringed sorts are the most beautiful, seeds of them should be preferred. The double varieties are multiplied from cuttings. The best plants are raised from seeds sown every year; they should never be kept beyond the second season. Two sowings, one in March, the other in May, will supply the green-house with flowering plants from October till May, and even later. The produce of the first sowing must be prevented from flowering till the end of September, by nipping off the flower-buds as they appear. They should then (September) be well established in their pots, and they will require no care beyond ordinary attention, and keeping them from frost, to flower them well. The second sowing, the produce of which is intended to keep up gaiety in spring, should receive the final shift in September, and every blossom, as it appears, should be picked off till the beginning of January.

I have said nothing about watering and shifting, but these operations must, of course, be attended to. The plants should be placed a little deeper in the pots at every shift; and care must be taken to keep them from damping off in winter. As a preventive of this, feeders under the pots are recommended to be used, for the plants are very impatient of water administered to the soil. These feeders should be liberally supplied with water when the plants are in bloom. The Chinese Primrose, like its congeners, delights in soil composed of leaf-mold, loam, peat, sand, and a little charcoal.

The above is a mode by which these may be grown successfully in pots; but they may be cultivated with equal facility, and better chances of success, planted out in summer in pits. As in the former mode of culture, sow at the same time, and forward the plants in pots in the green-house till the end of May, when they should be turned out of their pots, and planted in prepared compost in a frame under a north wall. Keep them close for a few days after planting, then remove all covering, and leave them freely exposed to the weather, night and day, till the time comes about for lifting them and potting them, which should be about the middle of September. After they are potted, replace them in the same frame, and shade them for a day or two, to keep them from flagging. In about a fortnight, remove them to the green-house, where they will bloom well throughout autumn. Seeds for specimens for spring-work should be sown about the middle of April, and treated as the autumn flowers, taking care to keep them free from frost and from damping off in winter. After they have done blooming, they may be planted out as before, and will flower well next autumn.

I have seen plants not excited by fire-heat or allowed to flower in the previous winter and spring, blossom well in the flower-garden during summer; and, not over luxuriant, but strong old plants, put out in a west aspect in September, on an elevated dry border, under the shade of neighboring Laurel-boughs, have been known to survive the winter near London, and to put forth flowers with the Crocus, Polyanthus, and other fair harbingers of summer. They did not suffer so much from frost or snow as from the cold winds of March, "while winter still lingers on the verge of spring." —*Cottage Gardener.*

Rapidity of Vegetation.—It has been stated by botanical writers, that some of our forest trees, such as the oak and walnut, perfect their growth for the year, and form their terminal buds, in a few hours or days after they commence shooting. They have been known to make such shoots of twelve or fourteen inches in length in 48 hours, finishing their growth, and forming winter buds in that time. The terminal buds on some kinds of shrubbery, the lilac for instance, are, on the main shoots, formed early in the season.—*Gen. Farmer.*

About Oranges.

If we consult botanical authorities, we shall learn that the *citrus* family embraces within it the orange, the shaddock, the citron, the lemon, the lime, and the forbidden fruit. Of these there are many different species, all natives of tropical countries, where they flourish in great abundance. According to some authors, there are as many as seventy-five species of oranges, both bitter and sweet, forty-six of lemons, seventeen of citrons, eight of limes, six of shaddocks, and five of bergamots.

These varieties are now to be met with in all parts of the East and West Indies, Australia, Japan, the Cape Colony, in South America, the Azores, Spain, Portugal, France, and Italy. It may readily be imagined how highly prized these juicy fruits are by the parched inhabitants of tropical countries, how eagerly a small cluster or grove of oranges or shaddocks is sought and tended by dwellers in oriental lands. So welcome, so highly esteemed are those fruits as the choicest gifts of a bountiful Providence, that on New Year's Day, on birthdays, at marriage feasts, and at other festivals, the most fitting present by which regard and esteem may be marked, is an elegant little basket full of oranges and limes.

The cultivation of oranges in the Western Islands was introduced from Portugal; and so genial were the soil and climate found for them, that they have now taken the place of nearly all other produce, and have become a most important article of trade from those islands. Saint Michael annually exports two hundred cargoes of the fruit, amounting to about two hundred thousand boxes of a thousand oranges each. Terceira ships twenty or thirty cargoes. Saint Mary's and Fayal, however, have not nearly so large an export. The culture of oranges in all these islands is now as essential to the well-being of the inhabitants, as is the growth of rice to Hindoos, the produce of the vine to the people of southern France, or the yield of apples to our countrymen in the Northern States. Every family however poor, has his *quinta*, as an orange garden is termed, which may number from a dozen to a thousand trees. The marriage-portion of a bride of St. Michael consists not of money nor of jewels, but of a certain number of orange trees in full bearing; and that villager considers himself fortunate who can bestow a score of such trees on each of his daughters.

These quintals are prettily laid out; the trees being planted in regular rows, with tall, shady hedges about them, of some quick growing plants, which serve to break the force of the wind, and so protect the delicate blossom and tender young fruit during the equinoxes. They require seven years to arrive at maturity, during which time green crops of various kinds are taken from the ground, but seldom after the trees are in full bearing, unless by the very poor. They are planted twenty-five or thirty feet apart, and soon attain a height of thirty feet. Great pains are taken to keep them thoroughly free from the attacks of the insects, and also well pruned; an operation which is performed every year. The cultivator, in short, devotes the whole of his working hours and all the best energies to the care of his quinta, not only during its early growth, but when it has arrived at maturity; for upon its produce his main dependence is placed, quite as much indeed as that of an Irish cottier upon his potato field. The orange is his staff of life.

The cost of sheltering one acre of orange amounts to fifteen pounds sterling; eight pounds for the plants, and a further sum of about two pounds for placing them in the ground. For seven years they give no yield; during the next three years they produce a half crop, and at the end of that time may be said to be in full production. Some of these trees attain a great age and an enormous size—more than one we have heard of as measuring seven feet around the base of the stem. Their yield is also great, reaching in favorable positions and good seasons to so much as twenty boxes, of a thousand oranges each, from one tree; as many as twenty-six thousand fruit have been known to be gathered from one of these prolific trees, and it may therefore be readily believed that during the ripening season, large supports have to be placed beneath the branches to prevent the great weight of fruit from breaking them away from the trunk.

The appearance of the many quintas throughout the undulating face of Saint Michael, half hidden amongst dense shades of deep green foliage, is extremely picturesque. Some have their little cottage and patch of garden-stuff; others of ampler dimensions have their "casinos," and their rich pleasure-grounds and ornamental work; but all are surmounted by a tower of wood and a little flag-staff, whence on saint-days, and Sundays, and festivals, pennants and flags wave gaily in the sunny breeze, aping the fun and frolic that is going on below. On these occasions, be the occupants rich or poor, no work is attempted. Pic-nics, tea-parties of all kinds, with singing and dancing, and love-making on the soft green sward and under the shade of heavily laden fruit trees, whose golden treasures dance in the summer sea-wind, are the only occu-

pation of the people at those times. In those cool, pleasant retreats, the maiden and her lover, the priest, the peasant, the noble, the trader, and the busy townsman, all congregate.

In the quintas of the Azores, the orange trees blossom in March and April, when copious showers, added to the growing warmth of the sun, give new life to vegetation. In the best situations the fruit will begin to ripen by October, and in the following month a gathering may be made of small quantities for the London market, where the first arrivals of the season command high prices and ready sales. They are, however, not in full profusion until January, before which time the Portuguese seldom taste any. By the end of February the whole crop will be taken off trees, and the greater portion away from the islands. In this way the trees have not a very long respite between the gathering and the blossoming; they may, in fact, be said to be producing all the year round. A variety of other fruits will be frequently grown in these quintas, such as limes, guavas, citrons, lemons, etc.; but only for the local consumption, oranges being the sole article of export.

In Spain and Portugal the orange trees are planted and cultivated much in the same manner as in the islands, but without the necessity for shading by high fences. The Porto and Seville orange trees do not attain a similar size to those of the China and Saint Michael's, nor do they produce nearly as abundantly. The usual annual yield of a Seville tree will be eight thousand.

The consumption of oranges is very great in England. How much Americans delight in them all the readers of this magazine know. Those which we get in the West are grown principally in Cuba and Florida.

Substitutes for Coffee.

The roasted seeds of *Iris pseudacoris* (yellow water-iris), are said to approach very near to coffee in quality.

The seeds of a Goumelia, called in Turkey Kenguel, were shown at the Great Exhibition as extensively cultivated in the Kair-ar-eh and Komah, where they are roasted, ground, and used as coffee.

The roasted acorn, is said to be much used on the Continent under the name of acorn coffee.

The cicer or chick-pea roasted; beans, rye, and other grains; nuts, almonds and even wheaten bread, when roasted carefully.

The seeds of Broom (*Spartium scoparium*), and the dried and roasted berries of the *Triosteum perfoliatum* (Caprifoliaceæ.) In the West Indies, the seeds of several species of Psychotria (Cinchonaceæ); in Soudan, those of Dura and Nitta (*Inga biglobosa*); among the African negroes, those of *Parkia Africana;* and among the Tonguses, those of a species of Hyoscyamus—are all employed as substitutes for coffee.

The dried and roasted roots also of many plants. The carrot and turnip are used for this purpose, but more commonly the roots of the common goose-grass (*Galium Aparine*), especially in Ireland; while those of the dandelion (*Leontodon taraxacum*) and of chicory (*Cichorium intybus*), are extensively employed both in this country and in Europe. In none of these roots, however, has the characteristic principle, coffein, been discovered, and none of them, therefore, can serve physiological purposes as the seeds of our common coffee.

Sweet Potato Seed.—A correspondent of the *Southern Planter*, writing from Charlotte, Va., says: "I will give you the mode of keeping sweet-potato seed in kilns, by myself and others in this section. We generally put them up in the patch where they are dug. Raise the earth six or eight inches in a circular form as a kind of floor, sufficiently large for the quantity of seed you wish for one kiln; set a stake in the centre, merely as a guide to put the potatos around, cover the earth with boards or pine bark, over this strew pine beards, then put on your potatos, letting the kiln terminate in a point at the top; cover with the pine beards, say two or three inches deep, then with boards or bark, throw on earth until the kiln is covered at least six or eight inches deep; over this throw potato vines plentifully, to prevent the rains from washing the dirt down, and in the spring they will open in fine order. I design keeping my potatos for table use in this way the next season. Some cover their kilns with leaves or straw, and erect a temporary scaffold (or shelter) over the kiln, but I prefer the vine as they are at the spot ready to be thrown on. The stake should not project beyond the top of the potatos. I generally saw them off previous to covering the kiln.

Girdled Trees.—"Take out a block of wood extending into the bark above and below the girdle, and take from the body or limb of another tree, a block corresponding in size and shape, with the bark on, and adjust it in the place, and bind it there, on the principle of engrafting." This plan, it is said, has proved completely successful.

Editor's Bureau.

TERRA COTTA.

Four thousand years ago Terra Cotta was a legitimate building material; specimens of it are still in existence, and in good preservation, taken from the ruins of ancient Thebes. By the Romans Terra Cotta was much used for statuary, architectural decorations and sewerage; and in modern times it is almost universally employed in Germany and Italy; extensively in France and England; to a certain extent in New York, Boston and Philadelphia, and is just making its advent in Cincinnati. And yet, there are numbers and numbers of people who are not only unacquainted with its merits, but are actually ignorant of the name, and, on seeing it in print, do not know whether it is a new kind of shaving soap or something good to eat. Terra—earth—Cotta baked or cooked, cooked earth, and without this cooked earth or terra cotta (to quote the words of the *New York Tribune*,) "civilization would make but a poor figure, for all our bricks are of one kind of this manufacture, and all our earthen plates and dishes another kind—all baked earth. However, as the term is now applied, it means more strictly a combination of two kinds of clay, varying slightly in their composition, though both known as potter's clay, with clean sand from the sea beach, mixed into a plastic mortar, and moulded into statues, vases, window and door lintels, chimney tops, trusses, cornices, and, in short, everything usually carved in stone, which are then burned in a kiln to such an intense degree that it actually becomes more indistructable than many of the kinds of stone used for the same purposes."

Our attention has been particularly called to this material, by the appearance of the Woodward High School, all the ornamental work of which is Terra Cotta, from the works of Steinauer, Henzler & Co., of this city. This building, which is one of Hamilton's designs, and probably the handsomest Gothic structure in the State, is the first important work in which Terra Cotta has had an opportunity of showing itself in Cincinnati, and is worthy the attention of every one interested in building, as it is unquestionably possessed of many advantages, of which its great economy is probably the least. Small specimens of Terra Cotta, such as flower-vases, statuary, brackets, etc., have frequently come under our observation during the last six months. At the Horticultural Exhibition held upon the Orphan Asylum grounds, there were numerous vases and figures of this material.

Terra Cotta, as we before remarked, was used in Egypt, and afterwards in Italy; but with the fall of Rome fell Terra Cotta, the manufacture was discontinued, and it is not much more than a hundred years since its revival. The works that have been executed in that time, on the continent of Europe, it would be difficult to enumerate. In Munich the public library is decorated with Terra Cotta, as are numerous other buildings in that city. In Italy the town of Ferrarra is entirely built of it. In fact, it is found all over the continent. In England some of the finest buildings owe their beauty to Terra Cotta; amongst which we may name Buckingham Palace, Greenwich Hospital, and St. Pancros Church—the latter one of the largest and richest churches in London. In this country Terra Cotta has only been introduced some six or seven years; but during that time it has been extensively adopted in Philadelphia, Boston, and New York, and has stood the test of the severest winters without injury. In New York, one of the best specimens of Terra Cotta is in the St. Dennis Hotel, at the corner of Broadway and Eleventh streets.

To give a list of the uses to which Terra Cotta can be advantageously applied, would be too serious an undertaking; but as a general rule, it may be substituted for carved stone and wood, and cast iron, for external ornamentation of buildings, and is probably more durable

than any of these materials, where it is not exposed to violent usage.

There is one use to which it can be applied with advantage. For house cornices wood is perishable and inflammable. Terra Cotta is actually cheaper, more indistructable than stone itself, and looks nearly as well.

HOVEY'S MAGAZINE.—THE CONCORD GRAPE.

In the last number I said all that I had to say as to Mr. Hovey's slur about my having received a grape vine, and, because I had suggested the possibility of its not suiting our climate and taste, although at the same time, I had stated that every attention should be paid to the plant, and that it should be fairly tested, and the results fairly reported, I had not intended taking any further notice of Mr. Hovey's remarks, but have received a copy of the *Practical Farmer*, printed in Boston, wherein a correspondent of that city has alluded to the subject in such a way that I deem it necessary to quote a part of his communication.

The closing part of the extract throws some new light upon Mr. Hovey's "*secondary thing*," which we poor Cincinnatians had supposed Mr. H. had intended to apply to the strawberry called McAvoy's Superior. Whatever may unfortunately have occurred in the Massachusetts Horticultural Society, in the way of such an "unfortunate mis-step," the world may rest assured that the Cincinnati Society do not "follow suit," nor will they do so. The "secondary" character of the strawberry is denied by all who know it. J. A. W.

"Mr. Editor:—Will you allow me a few lines of space, in which to express the surprise occasioned by a perusal of the August number of *The Magazine of Horticulture*, edited by Mr. C. M. Hovey. I have been acquainted with this Magazine for many years. I did not approve of all its teachings, nor could I fail to perceive that its main object was not to enlighten the public upon the subject of Horticulture; but rather to direct their undivided attention to "our extensive nurseries," (as, with paternal pride, the editor delights to style his garden and grounds,) and to trumpet forth the praises of seedlings raised by himself, or let out to him alone. The Magazine, I repeat, was not all that I desired it to be; but it was the best Horticultural journal in New England,—for it was the only one. As we now have another medium of communication with brother horticulturists, which will, I trust, be open to communications on both sides of a controverted subject. Let me call attention to Mr. Hovey's article on—

THE CONCORD GRAPE.

"'Nothing has afforded us more amusement' [good soul! he is easily pleased!] 'than Dr. Warder's acknowledgment of the receipt of one of the vines of this variety, presented to him by Mr. Bull. The Doctor, * * forgets the old adage, and, for once, not only looks a gift horse in the mouth,' but actually stares at him with both eyes wide open.'

"Not stopping to inquire whether Mr. Hovey has increased the force of the 'old adage,' by his addition': let me ask, if this is the system that prevails in your Society (for it has been so charged)—this system of *not* looking 'a gift horse in the mouth,' simply because he is a gift? —the old game of 'tickle me, and I'll tickle you?' Mr. Hovey's open avowal of the principle—his abortive sneer at Dr. Warder for not following suit, proves one of two things: either the thing is so common among you, that it has become a matter of course, or your brother editor is hopelessly lost to all sense of shame.

"But Mr. Hovey contines:—

"'Suppose, again, we should say, 'it is bad policy for dealers to send forth exaggerated statements as to the quality or merits of new things, at the risk of public disappointment.' If this *should* be so, (and why should'nt it, if 'good authority' says so,) about the Concord Grape, would it be any more discredit to the 'dealers,' than it would be to a society who should not only recommend a secondary thing, but give it a $100 prize to make it sell?'

"I do not remember, sir, ever to have seen an instance of meanness more glaring than this. The 'secondary thing' recommended by the Society, I understand to be the Boston Pear; and the $20 gratuity given 'to make it sell' (the numerals—$100—in Mr. Hovey's article, are evidently a typographical error,) is charged to have been obtained by Mr. Hovey himsdlf, through improper interference, etc., etc.; and now he turns upon the Society, and (taking advantage of his own wrong) flings into their teeth their unfortunate mis-step."

The Drouth.

This season has been remarkable for the absence of rain, since the early summer. Great has been the suffering consequent thereupon, and loud will be the lamentations thereat. In field, in garden, in nursery and orchard, in lawn and forest, the various representatives of vegetable life silently suffer, while grumbling man loudly complains, for the loss of his crops, his floral beauties, his shortened growth-shoots, and diminished fruits, his lost or embrowned greenery, and the sere premature ripeness of foliage, that replaces the brilliant autumnal hues of our usually gorgeous forests.

Let all learn a lesson—lands thoroughly drained and trenched have not suffered from

the drouth !! Would not three such seasons of excessive drouth be a blessing to us, if therefrom we might learn the value and necessity of *thorough culture ?*

Yes, a very good sermon might be preached to farmers and gardeners from this text—or rather a first rate agricultural lecture, by any one who had enjoyed the privilege of comparing, during the trying dryness of the past season, two pieces of ground that had been subjected to the same parching influences, but which had been differently prepared to resist them.

On our natural soils we often observe a great difference in the powers of resisting the two extremes of wetness and dryness ; by observing this alone, we might learn a most useful lesson in this regard. Where the earth is chiefly composed of clayey matter, we find the invaluable property of the alumina rendering it more tenacious of moisture ; but if it be chiefly made up of sand, or small particles of silica, or gravels, or pieces of indurated shaly matter, it is not fitted to retain moisture for the support of plants, and unless frequently watered by genial showers, or by artificial means, plants will suffer. Think not, however, that stiff clays are more fortunate in this respect—the frequent and wide cracks that gape open during dry weather, in such soils, expose the rootlets to the most trying evaporation. But clays especially, may be immensely benefited by proper cultivation, deep and thorough, and by under-draining. This is most evident whenever we have a proper opportunity to observe a piece of ground that has been so treated, or which has been favored naturally with a porous subsoil. Such a subsoil may be imitated by draining, which reduces or lowers the level of tke permanent water line, even when the whole of the subsoil for many feet or yards in depth, consists of dense impervious clays.

It often happens, even in the lighter soils, that there is found, at the depth of from eight to eighteen inches, or more, a stratum of indurated material, commonly called hard-pan; this may be composed of gravel or sand, cemented by iron, or it may be a layer of hard clay, not permeable by water. Another form of hard pan is but too common a result of our defective agricultural implements in field-culture, more especially than in the garden ; it is altogether artificial, and results from the tramping of the horses' feet in the bottom of the furrow, and still more from the downward pressure of the plow ; few persons may have thought of this serious objection to that instrument, which has been the great representative of agriculture for many ages, yet it will be apparent to all who think for a moment upon its action, as a wedge pressed through the earth, and raising a portion of the soil in a direction opposite to that in which it is drawn, that a corresponding pressure in the opposite direction, or downward, upon the earth in the base of the furrow, must simultaneously occur.

Now, the great desideratum will be to break up all such hardened layers, whether natural or artificial, by sub-soil ploughing in the field, and by trench digging, in the garden. This should be done for the double purpose of allowing the surplus water on the surface to pass downward, and of permitting the rising of moisture from below by capilarity, to supply the plants during a severe drouth.

Now, then, I return to the original proposition, and all will agree with me who have witnessed, during the past season, the beauty of the crops upon those pieces of ground that have been drained and sub-soiled, or trenched ; and compared them with the miserable parched failures and disappointments that have been so abundant everywhere through the country. And now, I venture the proposition suggested in a previous paragraph ; three such seasons of drouth would prove a permanent blessing to the cause of agriculture and horticulture in our country: for they would force us to think of the better and more thorough cultivation of the soil, and our interest would force us to act out our thoughts in delving, sub-soiling, or other appropriate actions, whereby the drouth would be rendered harmless and the produce of the soil would be greatly increased.

TRANSACTIONS.

Cincinnati Horticultural Society—Fall Exhibition.

The most beautiful exhibition ever held in the West was made by the Society in the end of September. The Committee of Arrangements having been satisfied that no creditable show could again be made within doors, not merely on account of the limited space, but because of the injury done to the plants, had determined, very early in the season, to erect pavilions for the Autumnal Exhibition. A fine lot was secured and the necessary arrangements were made, five large tents were erected, making an extent of five hundred feet—these were arranged so as to meet one another at right angles, and that in the central portion, being wider than the rest, was devoted to ornamental designs, chief among these was a basin and fountains; the rock work, ornamented with fine plants, presented a very imposing effect, especially when the spray was seen against a bold back ground of rockwork and greenery, admirably constructed and arranged—the whole of the pavilions being well lighted up with gas, the grounds afforded a delightful retreat during the evening as well as in the daytime, and were visited by thousands, who all expressed themselves highly gratified. But a just description of this show would be almost impossible, and will not be attempted upon this occasion.

Notwithstanding the terrible drouth of the past season, the gardens and greenhouses, as well as the orchards, vineyards, and graperies, furnished an ample quantity of beautiful specimens to make up a grand display that will long be remembered by the contributors and visitors as the great triumph of Horticulture. The following lists comprise most of the articles exhibited:

By Heaver & Etler, *Reading Road Nurseey.*

Pears.—Bourre Eastor, Vicar of Winkfield, Figue de Naples, Lewis, Bezi de Montigny, Charles of Austria, Seckel, Glout Morceau, Beurre D'Angleterre, Napoleon, Passe Calmar, Black Worcester, Pfiester's Meadow, and six other varieties. Chinese Quince, German Medlar, Guava, ripe and on the tree, Dwarf Pomegranates.

Grapes—*Hot House Varieties.*—Black Hamburgh, West's St. Peters, Scharges Henling, Palestine, (bunch measuring 20 inches in length,) Royal Muscadine, White Sweetwater, Grizzly Frontignan.

Pot Plants.—2 Vinca alba, Vinca rosea, 2 Salvia splendens niger, Salvia amabilis. 3 Clerodendron fragrans, 2 Clerodendron fallax, Angelona Gardneria, 2 Plumbago capensis, Ipomea Broadleyana, 2 Manettia cordifolia, Francisce acuminata, Zauschneria Californica, Scultellaria ventenata, Hibiscus sinensis, 2 H. sinensis janne, H. rosea, 2 H. lutea, Lcora rosea, Arelia rupestris, Trachelium cœruleum, 2 Asclepias salicifolia, Physanthus albus, Ampelopsis tricolor, Bouvardia splendens, Cuphea platycentra, Hœmanthus coccineus, 2 Brugmansia floribunda, White Horse Shoe Geranium, Corise unique, Lantana Ewingii, Lantana mutabilis major, Lantana compacta, (new seedling,) 2 Cyrtoceras reflexus, Dracœna terminalis, a singular flaglike plant, with reddish purple leaves, Laurus camphora, the camphor tree, Pittosporum variegatum.

Twelve Varieties of Phlox.—Blanc De Neuilly, Madam Aubyn, Alba rosea, Alta perfecta, Candidissima nova, La Nymphe, Princess Marianne, Arsinœ, Imbricata, Abdul Medjid, Madam Jane Henderson, Delicate.

Nineteen Varieties of Verbenas—Louise Meillez, Fanny Fern, Grand Sultan, General Brea, General Washington, Robusta, Marianne, Defiance, Queen, Downingii, (new and extra fine,) Wonderful, Kate, Striped Eclipse, Louisa Pfeiffer, Rainbow, Royal Purple, and three other varieties.

Petunias—A. J. Downing, Vanguard, Sundial, 1 pair hand bouquets, Display of Bouquets, Collection of Evergreens.

Dahlias. 24 Varieties.—Queen of England, Mrs. Hansard, Rival, Græfen Hohenthal, Gaiety, Satirist, Marchioness of Lorn, Mr. Selden, Baron D'Morelle. Shylock, Constantia, Rainbow, Marchioness, Cornwallis, Horace Bluney, Gem, Lieblicte Von Estherthol, Eldorado, Striata Perfecta, Queen of Primroses, Queen of the French, Lady Granville, Cheltenham Queen, Miss Lex, Mont Blanc.

Evergreens in pots.—Two pairs Cedrus deodara, sacred cedar of the Hindoos, one pair Cedar of Lebanon, Juniperus excelsa, Juniperus sinensis, 3 Cryptomeria Japonica, 1 pair Araucaria imbricata, 1 pair Abies morinda, 1 pair Abies Douglassii, one pair Abies excelsa (Norway spruce,) 1 pair Abies alba, (white spruce, 1 pair Abies canadensis, (Hemlock spruce, 1 pair Pinus macrocarpa. 1 pair Pinus Austriacus, (Austrian Pine,) 1 pair Pinus strobus, (White Pine, 1 pair Thuya occidentalis americana, (American Arbor Vitæ), 1 pair Mahonia aquifolia, (Holly leafed Barberry, 1 pair Mahonia fascicularis, 1 pair Taxus aurea, (gold striped, Yew,) 1 pair Taxus baccata, (English Yew,) 1 pair Tree box, 1 do. gold striped, 1 pair Cupressus funebris, (funebral cypress,) 1 pair Libocedrus chilensis.

By Joseph Dunlop, *Gardener to Peter Outcalt.*

Hibiscus rubra, Scutelaria ventenata, Torrenia asiatica, Lantana mutabilis, 2 Lantana Ewingii, 2 Lantana circea, crocea superba, do. pulcherrima, do. Mortayziana, do. fusca, 3 Plumbago capensis 2 do Larpentæ, Begonia Maculata, 3 do rosea, 2 do parvifolia, 3 do. Evansiana, Maurandia Barclayana, 3 Cuphea platycentra, Nierembergia gracilis, do. filicaulis, Heliotropium immortale, do. Maria, do. lilacinm, do Souveneir de Liege, 2 do peruvianum, 2 do Voltaireanum, 3 Angelona Gardnerianum, Porphyricoma lanceolata, Euphorbia splendens, do. trigona, Centradenia rosea, Double White Feverfew, Bouvardia triphylia, 3 Salvia splendens major, Malvaviscus mollis, 2 Asclepias curasavica, do salicifolia, Ruellia formosa, Vinca alba, Achimenes longiflora, do. grandiflora, Trachelium cœruleum, Pateris crenulata, Scarlet Geranium, 2 Pentas carnea, Lycopodium arboreum, 2 Verbenas, White cluster, do. St. Marguerite, do. Mount Ætna, do. Solstice, General Scott, Tricolor.

List of Green House Plants, from H. H. Williams, *of River Road Nursery.*

Ageratum caulescens, Asclepias curasarica, Abutilum venosum, do. striatum, Crinum amabile, Celosia compacta, Clerodendron fragrans, do. fallax, Cestrum laurifolium, Hibiscus rubra plena, do. single red, Ipomœa Broadleyna, Jasminum grandiflorum, Lagerstrœmia indica, Lantana Ewingii, Plumbago capensis, Russelia juncea, Schubertia grandiflora, Stigmaphyllon ciliatum, 4 Salvia splendens major, do. Grahamii coccinia, do. Pseudo coccinea, Vinca alba, Bouquets, cut roses, &c.

By Edward Kelly, *Gardener to* S. W. Pomeroy.

Lycopodium cœsium, Oncidium flexosum, Torrenia asiatica. Russelia juncea, Pomegranate, Begonia fuchsioides, B. hydrocotifolia. B. nitida, B. Incarnata, B. jasminoides, 2 Cuphea platycentra, Ruellia formosa, Manettia cordifolia, Plumbago Larpentæ, Plumbago capensis, Rondeletia speciosa, Nierembergia filicaulis, Acacia armata, Salvia splendens major, do. amabilis. Double Feverfew, (Pyrethrum.) Hibiscus rosea, Heliotropium peruvianum, and Souvenir de Liege, Solanum jasminoides, Justicia

carnea, Angelona Gardneriana, Lophospermum scandens, Goldfussia glomerata, Oxalis rosea, Asclepias curassavica, Cyclamen persicum album, 2 Clerodendron fragrans, 4 Maurandia Barclayana, blue and white, 2 Genista Rhadaphne, Physanthus albus. Columnea Schiediana, Aloysia citriodora, Bouvardia splendens and venusta, 2 Diosma ericoides. Porphyricoma lanceolata, Nerium splendens, Vinca rosea and alba. Myrtus latifolia, Hydrangea radiata, Ageratum mexicanum.

VERBENAS.—Morphe, Orb of day, Favorite, Laura, Kate, Marianne, Viscata, Defiance. Louise Meillez, 5 Petunias, Tom Thum, Geranium, 4 Rustic Tubs.

List of Plants from S. S. JACKSON.

Cycas revoluta, Quisqualis sinensis, 2 Calathea zebrina, 3 Gesneria zebrina, Ficus elasticus, Euphorbia splendens, do. bryonii, Stigmaphyllon ciliatum, Nepenthes destillatoria, Laurus camphora, Fuchsia coccinnea, Torrenia asiatica, Russelia juncea, Coffea arabica, Crinum amabile, Nierembergia grandiflora, Myrtus multiplex, Abutilon striatum, Kennedia maryetta, Plumbago capensis, Manettia tricolor, Lycopodium sp. nova, 2 do Wildenova arborea, Leschenaultia formosa, Fabiana imbricata, Angelona Gardneriana, Achimenes longiflora alba, Abelia rupestris, Opuntia horrida, 2 Lantana fuscata, do. elegans, 2 Salvia splendens major, Salvia Grahamii. Habrothamnus elegans, Eupatorium blue, Pomegranate, Chinese Hibiscus, d'lle red, Polygala grandiflora, Hoya carnosa, Stephanotus floribundus, 2 Ardesia crenulata, Begonia fuchsioides alba,

Ipomea Broadleana, Bletia Tankervillea, Begonia nitida, 2 Partridge breast aloe, Bouvardia splendens, do. triphylla, Begonia manicata, Geranium White Horseshoe, do, Tom Thumb. do. Flower of the day, do. Brighton Hero, Justicia picta, Dwarf lemon, 2 Sensitive plants 2 Cuphea platycentra, Solanum coriaceum, Cestrum laurifolium, 2 Oleander vase leafed, Aphelandra custata, Mandevillia grandiflora, 6 balsams, Cryptomeria japonica, 4 Magnolia grandiflora 2 Araucaria, Asclepias sallicifolia.

VERBENAS—2 Purity, Hippolite, 2 Mary, Etna, Conqueror, Nero, Uncle Tom, Robusta, Mrs. Stowe, Elizabeth, Grandis, Robert Ross, Mrs. Ewing, Mrs. Tweed, Fire Column, Oblopuette, Ann, Eliza, 36 Cuts flower.

DESIGNS.—1 Cornucopia, 2 large Moss Vases. 25 feet of chain wreath.

JOHN SAYERS—COTTAGE GARDEN.—Cyrtanthus magnificus, Volemcia odorata, 2 Lantana Ewingii, do. seedling, do. mutabilis, Rondeletia speciosa, 2 Cuphea platycentra, Russelia juncea, Clerodendron fallax, Araucaria excelsa, Polygala Dalmaisonii, Geranium Defiance, Horse Shoe, do. Cottage maid, do. Lemon-scented, 2 General Tom Thumb, 3 Hibiscus sinensis, pleno, do. flava, 2 Manettia cordifolia, 2 Nierembergia filicaulis, do. gracilis, Begonia Evansiana, do. hydrocotifolia, do. parviflora, do. argyrostigma, 3 Bouvardia triphylla, Asclepias sallicifolia, do. curasavica, Vinca rosea and alba, Salvia, luribarronici, do splendens major, do. speciosa, Plumbago, capensis, do. Larpentæ, 2 Gloxinias, Camphora officinalis, Jasminum odoratissimum, do. lucidum, Cryptomeria japonica, Achimenes grandiflora, Lycopodium arboreum, Maurandia Barclayana. Campanula hederacea, Acacia verticillata, Euphorbia splendens, do. sp., Abutilon striatum, Solanum jasminoides, 2 Heliotropes in varieties, Abelia rupestris, 2 Ficus elasticus, Baladium destillatorium, 12 Verbenas, 5 Petunias.

By G. SLEATH.

Apples, Grapes, Pears, Chestnuts and Filberts.

By H. WILLIAMS.

Mammoth Catawba and Brown Beurre Pears.

By W. SCARBOROUGH.

Apples and Pears.

By FRED. PARKER, (Cumminsville.)

Catawba, 4 plates.

By JACOB MUMMERT, Clifton.

Catawba Grapes.

By A. PFEIFFER.

White Doyenne Pears.

By JOHN C. JEFFRIES.

Duchesse d'Angouleme, White Doyenne, Beurre Diel, Bartlett, Belle Lucrative, Louise Bonne de Jersey, Oswego Beurre, Bezi de Montigny, Stevens' Genesee, Vicar of Winkfield, Columbia.

By JOHN PURDON, Urbana, O.

Belmont, Rhode Island Greening. Egerton, Jonathan, Spitzenberg, Williams' Favorite, Seek-no-Further, Hubbarston's Nonsuch, Fallawater, Bellefleur, 20 oz., Yellow Newtown, Gravenstein, Golden Russet, Roxboro Russet, Michael Henry, Vandervere, Rambo, Red Seek-no-Further, Winter Green, Gloria Mundi, Fall Pippin, Winter Pippin, Rawle's Janet, Gilpin, Brand's Seedling, Donaldson Russet, Pennock, Lady Finger (Kaighn's Spitzenberg,) Ortley, Ward.

By R. BUCHANAN.

Apples.—Drap D'Or, Maiden's Blush, English Codlin, Kaighn's Spitzenberg, American Pippin, Winter Pippin, Seedling do. Gatch, Baldwin, Prior's Red, Rambo, Swaar, Fallenwalder, Romanite, Chandler (Fall,) French Everlasting, Grafton's Winter Sweet, Rhode Island Greening, Fall Pippin, Ortley, Campfield, Pennock, White Winter Pearmain, Yellow Bellefleur, Golden Russet, Roxbury Russet, Red Bellefleur, Vandervere Pippin, Yellow Newtown do., Green do., do., Michael Henry, do., Monmouth do., White do, Newtown Spitzenberg, Willow Leaf, London Sweet, Harrison, Smith's Cider, Cooper, Red Doctor, Pearmain, Virginia Greening. Winter Sweet, Wine Sap, Delight, Ashland, Rawle's Janet, Wagener.

Pears.—White Doyenne, Seckel, Duchesse d'Angouleme, Maria Louisa, Glout Morceau, Beurre D'Aremberg, Napoleon, Prince's St. Germain, Beurre Diel, Winter Orange, German Musk, Louise Bonne de Jersey, Dix, Passe Colmar, Stone, Cumberland, Easter Beurre, Autumn Superb, Heathcote.

Plum.—Yellow Egg.

Grapes.—Catawba, Isabella, Schuylkill, Venango, Meadville, Herbemont, Tennessee, Minor's Seedling.

Potatoes.—Ashleaved Kidney.

By T. V. PETICOLAS.

Pears.—Orange Vert, Unknown, Belmont, Louise Bonne de Jersey, Rochester Fondante, Virgoulouse Heathcote, Napoleon, Br. Capiaumont, Croft Castle, Easter Beurre, Louis Philippe, Echasserie, Fredk. of Wirtemberg, Colmar, Br. d'Aremberg, Chaumontel, Gansell's Bergamott, White Doyenne, Clion, Bartlett, Shobdencourt, Beurre Diel, Glout Morceau, Passe Colmar, Bleeker's Meadow, Urbaniste, Dix, 4 Unknown.

Stowell Evergreen Corn, Otaheite Corn.

By D. Z. SEDAM.

Apples.—Putnam Russet, Green Newtown Pippin, Yellow do. do., Rawle's Janet, Virginia Greening, Bell, Russet, Ortley, Rambo, Pennock, Am. Golden Russet, Bellefleur, Tulpehocken. Sheepnose, Black Apple, Fall Pippin, Monstrous Pippin, Hay's Red Winter; Pears, Quinces.

By J. K. GREEN.

Bartlett Pears.

By A. SMITH.

Smith's Seeding, Quinces, Heath Cling Peaches.

A List of Native Grapes, by FRANCIS PENTLAND, *Gardener to N. Longworth, Esq.*

Coleman's (White), Burlington, Pentland, Longstem, L. Mott, Frankfort, Tennesee, Mammoth Catawba, Minor's Seedling, Rose, Ohio or Segar Box, Lee, Catawba, Arkansas Catawba, Winne Grape, Union Village, Clermont County Catawba, (cultivated 45 years,) Hotchkiss, (a Fox Grape,) Traminer, (or Delaware,) Raabe's No. 3, Belmont, Clement, Scioto, Diana, Pond's Seedling, Thatcher, Herbemont.

By M. S. WADE, JR.

Apples.—Emperor Alexander, Ladies' Sweetling, Esopus, Spitzenberg, Newtown do., Lady, Pumpkin Sweet, Ribston Pippin, Swaar, Fallenwalder, Strawberry, Black Gilliflower. Seek-no Further, Beech Grove Russet, Michael Henry Pippin, Romanite, Golden Harvey, Winter Sweet, Surprise, Red Ingestrie, Jonathan, Campfield, Rambo, Stroat, Baldwin, English Golden Pippin, Desert Apple, Newtown Pippin, Gravenstein, Bellefleur, Siberian Crab, Yellow Ingestrie. A number of varieties selected by Samuel Newell, supposed to be Hamilton county Seedlings.

Grapes.—Seedling Isabella, Catawba, Isabella.

Pears.—Napoleon, Baum Pear, Duchesse d'Angouleme, Flemish Beauty, Beurre de Capiumont, Passe Colmar, Easter Beurre, Swan's Orange, Bartlett.

By T. V. Petticolas.

60 *Apples.*—Cooper, Harrison, Michael Henry, Yellow Newtown, Green Newtown, Minister, Newtown Spitzenberg, Romanite, Milam, Weaver's Winter, 2 Seedling, Pumpkin Russet, White Pearmain, Baldwin, Kaighn's Spitzenberg, Fallenwalder, Lansinburg, Ramgate Cheese, Small Black, Virginia Greening, Sweet Bellefleur, Winter Pearmain, Ribston Pippin, Mela Carla, Golden Ball, Smith's Cider, Vandervere Pippin, Pennock's Red Winter, House Russet, Winter Seek-no-Further, White Pippin, Fall Pippin, Broadwell's Sweet, Campfield, Golden Russet, Belmont, London Sweet, Willow-leaf, Yellow Bellefleur, Hubbardston Nonsuch, Ramsdale's Sweet, Black Apple, Tolman's Sweet, Swaar, Illinois Green, Rhode Island Greening, Maiden's Blush, Fall Wine, Rambo, Rome Beauty, Rawle's Janet, Detroit, (Ortley,) Winesap, Putnam's Russet, Titus Pippin, Fine White Apple.

Grapes.—Isabella, Catawba, Minor's Seedling, Cape, Segar Box, Lenoir.

Plums.—Frost Gage.

By Jos. Dunlop, *Gardener to Peter Outcalt.*.

Pears.—Bartlett, Flemish Beauty, Seckel, Urbaniste, Wilkinson, B. Easter, B. Brun, B. d'Amaulis, B. d'Aremberg, Napoleon, Heathcote, Dix, Gansel's Bergamot, Passe Colmar, Le Cure, Henry Fourth, Echasserie, Grey Doyenne, Bezi de la Motte, Lewis, Princess of Orange, Figue de Naples, Ball, Louise Bonne de Jersey, Orange Vert, Pennsylvania, Colmar, Glout Morceau, Beurre de Capiumont, and two unknown.

By Thomas Lambert.

Apples.—Ortley, Yellow Bellefleur, Rhode Island Greening, Jersey Sweet, Jewett's Red, Pennock, Campfield, Putnam Russet, Swaar, Wine Sap, Kyle's Red Winter, Fall Pippin.

Pears.—Glout Morceau, Crassane, Doyenne Gray, Chaumontelle, Easter Beurre, Urbaniste, Vicar of Winkfield, Winter Nelis, Beurre d'Aremberg, Croft Castle, 3 unknown.

By S. Brown.

Pound Pear, Golden Pear, Seedling Apples.

By C. Sanders.

Foreign Grapes.—Display, 9 var., 4 var. Black Hamburg, Black Morocco, Syrian; Specimen Bunch, Black Hamburg.

By David E. A. Strong.

Basket of Peaches—Free Yellow, Do. Heath Cling, do. Apples—variety.

By T. Gilbert.

Twenty Varieties of superior Apples.

By M. Shipley.

Fancy Basket of Fruit.

By John Gentle.

Apples.—Rawle's Janet, Green Newtown Pippin, Fall Pippin, Smith's Cider.

By A. R. Whitney, *Franklin Grove Nursery, Lee County, Illinois.*

Apples.—Dominie, Golden Russet, Willow Twig, Rambo, Jonathan, Fameuse, Rhode Island Greening, Northern Spy, Michael Henry Pippin, Roxbury Russet, Black Gilliflower, Fall Swaar of the West, White Pippin, White Bellefleur, Fallenwalder, Holland Pippin, Cheeseboro' Russet, Fall wine, Pumpkin Sweeting, Hoss, Hawthornden, Summer Queen, Rocking, Fulton, Fall Pippin, Yellow Bellefleur, Maiden's Blush, Monarch, Vandervere, (our Newtown Spitzenberg.)

By S. Mosher.

Apples—Golden Russet, Newtown Pippin, Chandler, Vandervere, Smith's Cider, Yellow Bellefleur, Gravenstein, Baldwin, White Pippin, White Bellefleur, Rhode Island Greening, Hubbardston's Nonsuch, Virginia Greening, Fameuse.

Grapes.—Eight varieties of Native Grapes from Texas.

By J. K. Green.

Sweet Potatos, Neshannocks, Okra, Corn Stowell; Sugar, Tuscarora, Guinea and Pop, White Field, Yellow do.; Celery, 6 stalks.

By W. Cox.

Squashes, in variety, Japan Pea.

By T. J. Laboyteaux, *Willowdale.*

Field Corn.

By C. Sanders.

Vegetables.—Tomatos, display in varieties, Peppers, do. do., 1 doz. Long Blood Beets, 2 do. Turnip Beets, 1 do. Carrots, 1 do. Parsnips, 2 do. Salsify, ½ peck of Snap Beans, ½ do. do. var. ½ do. Okra, 3 varieties Onions.

By S. S. Jackson.

Corn, Chicken Corn, Sugar Beets, Citron, Sweet Peppers.

By John Purdon.

Seedling Potatos, 14 varieties, fine.

By John Young.

Corn and Potatoes.

By H. H. Williams

Sweet Potatos and Egg Plants.

By John Eccles.

1 doz. Long Beets, 1 do. Turnip do., ½ do. Silver Beet—Greens.

By F. Parker,

A collection of Vegetables.

By C. Wardell.

A collection of Vegetables.

The several committees made the following report of awards rendered;

REPORT OF THE COMMITTEE ON FLOWERS, FLORAL DEVICES, DESIGNS, ETC.

To the Cincinnati Horticultural Society:

The skill of our horticulturists, aided by the good taste and diligent labors of a number of those ladies who are ever zealous of good works, has given us such a specimen of fairy-land as delights all visitors, but embarrasses the Committee through the very abundance of its riches. The awards which they have the power of making are in nowise proportioned to the merit of the articles which call for them, nor are they sufficiently numerous to satisfy the Committee's love of justice.

The past season has been so unfavorable, that strong apprehensions were expressed by many of our members, that the exhibition could not be made worthy of the reputation already gained by the Society. It is, however, a source of great satisfaction to this committee to be able to state, that in the departments especially assigned to them this year, so far from being realized, has given place to the congratulations called forth by the uncommon beauty displayed in these departments, and the proofs thereby given of continued progress of improvement and good taste in the Society.

The stove and Green-house Plants now exhibited, are generally superior to those of any previous exhibition, and the Committee award to them the following premiums, viz:

For the best display of Green-house Plants, to John Sayers	$10 00
For the second best display of Green-house Plants, to Heaver & Eyler	7 00
For the twelve best varieties of Green-house Plants, to Edward Kelly	6 00
For the second best varieties of Green-house Plants, to H. H. Williams	5 00
For the best six varieties of Green house Plants, to Dunlap	4 00
For the best specimen plant (Lantana Mutabilis) to John Sayers	7 00
For the best six varieties of Petunias, to John Sayers	3 00
For the best six varieties of Phloxes, to Heaver & Eyler	2 00
For the best twelve varieties of Verbenas in pots, to John Sayers	4 00
For the second best varieties of Verbenas in pots, to S. S. Jackson	3 00
Roses, for the best 12 varieties, in pots, to Thomas Knott	3 00
Roses, for the second best varieties, in pots, to Thomas Knott	3 00
Asters, for the best twelve varieties, in pots, to Kelly, Evans & Co.	3 00
Cacti, for the best collections, to J. Howarth	3 00

EXTRA PREMIUMS RECOMMENDED BY THE COMMITTEE.

To Kelly, Evans & Co., for a fine display of Plants, and an improved method of labeling, Diploma and	$7 00

To S. S. Jackson, for a similar display of fine Plants, in good order.......... Diploma and 7 00
To Edward Kelly, for two rustic vases with Fine Plants.............................. 4 00
To S. S. Jackson, for a variety of beautiful Balsams.............................. 2 00
To Joseph Dunlap, gardener to P. Outcalt, for a variety of excellent plant.s............Diploma.
To T. Hutchinson, for a valuable display of dried plants and rare seeds............... 5 00
To Edward Kelly, for a beautifnl collection of dried Grasses and Ferns, from Great Britain 5 00
To A. Pfeiffer, for fine bouquets. ....Diploma.
To Mrs. Heaver, for a beautiful specimen of shell-work.............................Diploma.
To S. S. Smith. for a model in Shell, of the house of the late Gen. Harrison..........Diploma.
To Steinhauer & Henzier, for a variety of Terra cotta vases, used by several exhibitors....Diploma.
To Theodore Pfau, for a variety of curious Dwarf Plants.... ....Diploma.

The unfavorable influence of the remarkably hot and dry summer was manifested most in the department of Cut Flowers and Bouquets; there was, however, a better display of them than we had reason to expect, and the following premiums were awarded:

For the best display of Cut Roses, to A. Pfeiffer, $3 00
For Dahlias, best 24 varieties, to Heaver & Eyler.............................. 4 00
For Dahlias, best twelve varieties, to Mrs. Bishop,.............................. $3 00
For fine displays of various kinds of Cut flowers, to H. H. Williams, and to Kelly, Evans & Co., each...........................Diploma.
For Bouquets, best display, to Thomas Knott. $4 00
" " best pair round or pyramidal, to T. Knott............. .... 3 00
For Bouquets, best pair flat, to Heaver & Eyler $2 00

An assortment, containing every variety of tools necessary for the gardener, was exhibited by D. McAvoy; also, chests of gardening implements for Ladies.

Messrs. Huntington & Leboyteaux, and Messrs. Dickson & Le Botter exhibited some appropriate Porcelain, Terra-cotta, and other articles of great beauty.

Messrs. Hunnewell & Hill, on this, as on all previous occasions, have deserved the thanks of the Society for their kindness in loaning vases and other articles needed for the display of plants and fruits.

The water committee are also entitled to the thanks of the Society for the supply of water for jets, cascades, &c., as well as for ordinary purposes.

The department of the exhibition which was most attractive to a majority of visitors, was that of floral devices, wreaths, designs, &c. A special fund was, by subscriptions of some amateurs, devoted to premiums in this department and awarded thereon as follows, viz:

For the model of a ruined castle on a rocky eminence of the Rhine, to G. M. Kern............$25 00
For a summer house covered with blossoming vines, together with numerous tasty decorations and dwarf plants, and flowers, to A. Pfeiffer and his gardener, Sholtz, in equal proportions.............................. $20 00
For "The Elopement," a model af a Scotch Castle, with a lake, cottage, grouuds, figures, &c., to Mrs. Mary A. Howells............. $15 00
For two large Moss Vases, nine feet in hight, with flowers, to I. & J. Jacksou.......... 2 00
For a Cornucopia, with fruits of various kinds, and a chain wreath of twenty links, each link twelve inches diameter, to Misses Jackson.......................... Diploma and 5 00
For a model of his father's garden, greenhouses, &c., to Samuel Howarth, Jr....... 10 00
For the best model for ornamental grounds, being a model of the house and ground of R. Corwin, Esq., Lebanon, to Richard Davis 10 00
For a rural device, named the "Native American," formed of flowers contributed by Mrs. Richey, of Lebanon, to Richard Davis...... 4 00
For a model of villa grounds and summer-house, to L. Hildebrand.................... 5 00

One of the most attractive points of the exhibition was provided by the managers, in conformity with a report by the Committee in spring—Messrs. Pomeroy, Sayers, M. Kelly, McAvoy, S. S. Jackson, Outcalt, and Dr. Warder. It consists of a small pond, with a rocky border, on which and in the water was a variety of aquatic plants; in the center, on a rock, were two full-sized figures of Tritons, spouting jets of water through their shells. These were of Terra-cotta, from the works of Messrs. Steinhauer & Henzler, and were the specimens of statuary. A large aquatic bird, of the same material, appeared to be preparing to feed upon the gold fishes, of which a great number were swimming in the pond among the water lilies. This was the central point of the exhibition, and excited general commendation of the good taste displayed by the managers in this and the other parts of the exhibition.

Some leaves and a flower of the Victoria Regia were exhibited in this pond, and in a separate pond, by T. Pentland, gardener of Mr. Longworth.

The debt of gratitude due by the Society and the public in general, to the ladies' good taste and diligent labors which have contributed so largely to the attractions of the exhibition, can not be paid, but it should be publicly acknowledged.

The Committee, therefore, recommend that a vote of thanks be passed by the Society, and presented in the form of a Diploma to each of the following named ladies, in addition to those to whom premiums have been awarded, viz: Mrs. Gray, Mrs. Blakewell, Mrs. Graham, Mrs. Bickham, Mrs. McAvoy, Mrs. Sleath, Mrs. C J. Wright, Mrs. Heaver, Mrs. Hewson, Mrs. Urner, Mrs. J. P. Foote, Mrs. Hinsdale, Mrs. Holmes, Mrs. M. Peters, Misses Bickham, Misses Bakewell, Miss E. Brooks, Miss Mosher, Miss Augusta Johnson, Miss Slaymaker, Mrs. J. Harding, Mrs. Ferguson, Mrs. Bartlett, matron of the Orphan Asylum, Mrs. P. Outcalt, Mrs. J. Hastings, and Miss Rentz.

COMMITTEE.

J. P. FOOTE,	F. PENTLAND,
T. PFAU,	R. V. ROSS,
RICHARD DAVIS,	D. McAVOY.

REPORT OF THE COMMITTEE ON FRUITS.

FRUITS.

PEACHES.—D. E. A. Strong, 2 var., gratuity. $3 00
E. L. Taylor, 2d best do. do 1 00
PEARS.—Best 6 var., 5 each, J. Jeffries, premium, 5 00
2nd do. do. do., T. Lambert, do. 3 00
Best display, Peter Outcalt,......... do... 8 00
2d do. do. T. V. Peticolas,....... do... 4 00
APPLES.—Best 10 var., D. Z. Sedam.... do... 8 00
2d do. do. A. R. Whitney.. do... 6 00
Best 5 var., W. H. Pye............ do... 3 00
2d do. do. John Gentle.......... do... 2 00
Best display, T. V. Peticolas...... do...10 00
2d do. do. R. Buchanan......... do... 5 00
QUINCES.—Best half peck, Moses Shaw.. do .. 2 00
2d do. do. S. S. Jackson.. do... 2 00
PLUMS.—P. S. Bush, gratuity............. 1 00
HARDY GRAPES.—Best 3 var. T. V. Peticolas, pre. 5 00
2d do. do. S. Rentz...... do. 4 00
Best display, N. Longworth......... do. 6 00
2d do. do. S. Rentz............... do. 4 00
FOREIGN GRAPES.—Best Bunch C. Saunders, do. 3 00
2d do. W. Heaver,...... do. 2 00
Best display, C. Saunders,........... do. 6 00
Interesting display of fruit G. Sleath gratuity.. 3 00

VEGETABLES.

J. K. Green, best half peck Okra.............$1 00
A. Williams. best display Sweet Potatos...... 3 00
F. Parker, 2d do. do. do do. 2 00
T. V. Peticolas, best 12 ears Sugar Corn....... 2 00
J. K. Green, " 24 " " " 3 00
C. Saunders, " half peck Snap Beans.... 2 00
" " " Tomatos........... 2 00
" " " Onions, 2 vars....... 2 00
" " " " from seed direct. 1 00
" " " Carrots.............. 1 00
" " " Peppers, best display 2 00
" " " Beets, best 12 roots Dip.
John Eccles, " " " 2d best......... 1 00
Wm. Cox, best 6 vars. Squashes................. Rev.
J. K. Green, best 6 stalks Celery............. "
A. Pfeiffer, Cucumbers........................ 1 00
J. Young, for a collection of vegetables....... 1 00
C. Wardell, for a " " 1 00
Fred. Parker " " 1 00
G. Sleath, " " 1 00
Levi Hutchinson, " " 1 00
R. Buchanan, Ash leaved Kidney Potatos.... 1 00

The Louisville Horticultural Exhibition.

The annual exhibition of the Kentucky Horticultural Society, at the Mozart Hall, fully realized the highest expectations. The display of fruits, flowers, and plants was truly magnificent. We do not know that we ever saw finer peaches, apples, pears, melons, &c., even in the best fruit seasons, and most certainly the beauty of some of the bouquets of flowers could not be surpassed. The various committees appointed to award the premiums for the finest specimens of fruits and flowers, performed their duty, and the awards appear below.

The exhibition was exceedingly well attended at night by the ladies and gentlemen of the city. Mozart Hall was filled with a gay, happy, and admiring crowd. An address was delivered by Dr. T. S. Bell, characterized by the exceeding beauty of style, and great knowledge for which he is distinguished above almost all other men in the Western country. It was listened to by the greater part of the audience with close attention and high admiration, and, at its close, the learned speaker was heartily applauded.

LIST OF PREMIUMS AWARDED, SEPT. 19, 1854.

FLOWERS.

Best 10 exotics, in pots, Edward Wilson.
Best 5 exotics, in pots, Edward Wilson.
Best 3 exotics, in pots, Edward Wilson.
Best 12 named roses in bloom, Edward Wilson.
Best 6 named roses in bloom, Edward Wilson.
Best 4 named roses in bloom, Edward Wilson.
Best Table Bouquet roses, Edward Wilson.
Second best Table Bouquet, Edward Wilson.
Best display of good flowers, in hand boquet, Edward Wilson.
Second best display of good flowers in hand bouquet, Edward Wilson.
Best Table Boquet of mixed flowers, Edw. Wilson.
Second best Table Boquet of mixed flowers, Henry Nantz.
Third bestTableBouquet of mixed flowers, Edward Wilson.
Best Floral Design, Edward Wilson.
Second best Floral Design, Henry Nantz.
Best Floral Basket, Miss Florence Anderson.
Second best Floral Basket, Miss Louisa Gross.
JUDGES.—Dr. Donhoff, H. A. Griswold, Dr.T.S. Bell.

GRAPES.

Best Catawba X. Graft.
Second best Catawba, Arthur Peter.
Third best Catawba, Jacob Johnson
Best Herbemont Madeira, Jacob Johnson.
Best Native Grape, Norton's Seedling, X. Graft.
JUDGES.—John P. Morton, Dr. Clute, Dr. T. S. Bell.

APPLES.

Best dozen Bellefleurs, Jacob Stivers.
Best dozen Pryor Red, L. Young.
Best dozen Fall Pippin, J. F. Willey.
Best dozen Newtown Pippin, C. C. Cary.
Best dozen Gennetings, C. C. Cary.
Best display in variety, J. F. Willey.
Second best display in variety, Arthur Peter.
Honorable mention of a Seedling, worthy of culture by all lovers of frui , called Garr's Seedling.
JUDGES.—Dr. J. A. Moore, Dr. J. A. Warder, and A. G. Munn.

PEACHES.

Best half dozen White Cling, L. Young.
Best half dozen Colored Cling, Dr. A. W. Kaye.
Best half dozen White Free, Dr. A. W. Kaye.
Best half dozen colored Free, L. Young.
Best display of Peaches, L. Young.
Second best display of peaches, Jas. Stivers.
JUDGES.—Dr. T. E. Wilson, H. A Griswold, and Dr. Thomson.

PEARS.

Best dozen Fall Pears, C. C. Cary.
Best dozen Winter Pears, L. Young.
Best display of Pears, L. Young.
Best dozen Seckel Pears, L. Young.

PLUMS.

Best half dozen Purple Plums, George Heinsohn.
Best half dozen Light colored Plums, Gibson Mallory.
Best display of Plums, Wm. Kaye.
JUDGES.—H. A. Griswold, Dr. Wilson and Dr. Thomson.

VEGETABLES

Best White Neshannoc Potatos, Mrs. Peay.
Best Red Sweet Potatos, Geo. Heinsohn.
Best Red Yam Potatos, J. L. Kalfus.
Celery, not considered best—not sufficient in quantity, gratuity, $1 60. Riend Fliesh.
Best Egg Plants, not sufficient in quantity, gratuity $1 50. F. Berrenger.
Best Red Beets, not sufficient in quantity, gratuity $1 50.
Best Red Tomatos, George Hosea.
Best Long Green Cucumbers, gratuity $1 50 F, Berrenger.
Best Yellow Onions, Jacob Johnson.
JUDGES.—John Thatcher, L. Young, and Arthur Peter.

MELONS.

Best Watermelons, T. S. Robards.
Best Cantelope, George Heinsohn.

The Society are under many obligations to the following persons for the use of their green-house plants, which contributed very greatly to the interest of the exhibition: Mrs. Jas. Ford, Mr. L. L. Shreeve, Dr. Gross, and others.

Iowa State Fair.

From the local papers kindly forwarded to the Editor, it appears that the Fair Grounds have been the scene of a display of fine stock, vegetable productions, articles of mechanical ingenuity and artistic skill, &c., seldom excelled in the West. The entries were more numerous and of better qualities than at the previous Fair ; while the attendance was larger and embraced a much more extended scope of country. Probably more than 3,000 persons attended the Fair. The hotels in the city were all filled to overflowing, and we believe we never saw the streets and roads thronged as much with teams. The receipts in entrance fees and for tickets of membership were large—ample, as supposed, to defray the very heavy expense the Society has incurred in fitting up the grounds.

The Report on Fruit is from the *Muscatine Journal.*

The show of fruit this season, owing to the late frosts of spring and the summer drought, is very much inferior to what we should have otherwise expected, and falls below that of our last exhibition.

In some localities, favored by their situation, the fruit, though of much less yield, is very fine. We find, on exhibition of *Apples*—

44 varieties, by J. B. Essex, of Ill.
32 " by Hiram Gilbert, of Iowa.
63 " by James Cattelle, "

And several varieties by Messrs. Thomas Morford, Wm. Chambers, Sr., Jacob Long, J. Sherfey, S. Smalley, and Hon. J. Williams.

The committee have construed the "best specimen of apples" to mean the best specimens of the greatest variety of apples worthy of general cultivation in this locality, both from the character of the fruit and the bearing qualities of the tree.

They have divided the apple into four classes, into the first of which they have elevated the *Wine Sap*, because the tree is a sure, constant and abundant bearer, and the fruit is of the best second grade, while from te the first class they have reluctantly deposed the *Newtown Pippin*, because the tree is a very shy bearer, late in coming into bearing, and the yield very small.

Our examination has resulted in our conviction that Mr. Cattelle has presented a list of the best apples of fine specimens, and of the greatest number of the standard varieties, among which we would name a few, as, the Rambo, White Winter Pearmain, Roman Stem, Jennett, Newtown Spitzenberg, or Vandervere of Downing, Am. Golden Russet, and R. I. Greening, which have proved themselves worthy of general cultivation among us. We regret to see our cultivators filling their grounds and bestowing their attention upon such indif ferent fruit as the Penn. Vandervere, Catshead, Milam, and their compeers, which are always upon our tables and in our catalogues.

PEACHES.—Five choice varieties of this fruit are upon our tables, with several seedlings furnished by S. Gilbert, Mrs. Ogilvie, J. Cattelle, J. Sherfey, and J. B. Essex. Seedlings by J. P. Walton, and one variety each by S. Smalley and Drury Reynolds, of Illinois.

Some of the seedlings are very large, but generally their flavor is inferior. The budded varieties, free and cling, are of superior size and flavor, but, we would not be understood as recommending a resort to budding in all cases.

Mr. Cattelle has some very large peaches of the Newington variety, preserved in diluted alcohol.

We award the premium to Mrs. Ogilvie, whose clings and frees are of extra size and flavor.

PLUMS.—Very fine specimens Coe's Golden Drop are exhibited by Mrs. A. J. Fimple and Mr. Alex. Jackson. Those of the former are the largest, and entitled to the premium.

PEARS.—Single specimens of this choice fruit are presented by Mrs. Ogilvie, Messrs. Cattelle, Sherfey, Long, and Essex, but as they are all good varieties of their season, we can not determine, and award no premium.

GRAPES.—A fine specimen of Isabella, by S. Smalley, and ordinary ones of Catawba, by Mrs. Ogilvie and Mr. Cattelle; the former having the finest display, we award to her the premium for the Catawba, and to Mr. Smalley, for the Isabella.

The committee awarded the premium to Mr. Cattelle, for the "best variety of fruit," his list including a fine sample of Apples, a good show of Peaches and Grapes, and one variety of Pear.

Mr. Essex, of Illinois, presented for exhibition a large variety of apples, many of standard sorts, worthy of cultivation.

Dr. Weed presented six standard varieties of apples.

Respectfully submitted,

T. S. PARVIN,
ISAAC B. ESSEX,
ISAAC NEGUS.
TYLER McWHORTER,
SAMUEL GILBERT.

Visit to Louisville.

BY THE SENIOR EDITOR.

The show at Mozart Hall, on December 22d, was a very handsome affair, and deservedly attracted the attention of the beauty and gallantry of Kentucky. Crowds of visitors were present to enjoy the rich treat spread out before them by the Society, as a means of fostering a beautiful taste and a higher appreciation of superior fruits and Flowers. The Peaches of Lawrence Young and others were most beautiful, large, and fine, excelling anything we have had exhibited upon our tables. The Plums were good, but not in large variety. Quite an assortment of Pears were presented by different contributors, embracing the most approved sorts, and among them an unknown variety grown by Mr. Cary, of Jeffersonville, Indiana, which was considered equal to the Seckel. The Apples were generally interesting, as they represented the planting of a different region from our own, and contained some varieties that are not known among us. Some of these are worthy of attention, but there is also room for improvement in the selection of orchard fruits for the Louisville market, and it cannot be doubted that the intelligent members of their Society will soon eliminate, from their united observations, a list of Apples adapted to their soil, climate, and the popular taste. Foremost among those already tested are the Rawle's Janet, the Pryor's Red and Newtown Pippin, which are not excelled for winter varieties. The Blackburn, Fall Queen, and Fall Pippin are much admired as autumnal fruits. The first two are scarcely known north of the Ohio river.

Upon the table was a handsome plate of a new variety, of great promise, which has recently been brought into notice. The Garr's Seedling is a fruit of large size when fully developed, rather flat, with moderately deep basin and cavity; skin smooth, pale, greenish yellow, covered with an exquisite white blossom, resembling that of the Russian Apples.

The vegetables and melons were deserving of true special regard, as may be inferred from the weight of the Jewett and Mountain Sprout watermelons—forty-one pounds.

The plants were highly creditable to their owners, and showed the liberality of amateurs in contributing to the enjoyment of visitors. Many fine specimens were sent by Dr. S. D. Gross and others. Ed. Wilson, florist, excelled in roses, and was a large contributor of beautiful cut flowers, and bouquets.

A beautiful and appropriate address was read on the first evening, by Dr. Bell, and on the second night a spirited sale closed the exhibition, when prices were paid for the beautiful fruits that would astonish some communities. (Item—eight dollars for a plate of peaches, seven in number.)

My thanks are due to the society and its members for the many very kind civilities that were extended to me while their guest.

DIG DEEPLY, cultivate thoroughly, and you may defy the drouth and its consequences—for he is doubly successful who succeeds when others fail.

Hon. M. P. Wilder's Address, to the American Pomological Society.

It is my duty and privilege, at this fifth meeting, and third session under the present organization of our National Association, to bid you welcome to this tri-mountain city, the home of the Pilgrims. Here the colonists of Massachusetts Bay first pastured their flocks and herds. Here and, in the adjacent country, are the grounds which they cultivated, the gardens which their horticultural taste adorned, and in which they gathered some of the first fruits of American Pomology.

The seed of their planting has ripened, and reproduced itself in successive generations, and has been widely disseminated in other portions of our happy land. The spirit which animated our fathers and their coadjutors in other colonies, descended to their children; and it led, near the close of the last century, to the formation of societies for the promotion of agriculture.—These naturally developed the love of horticulture, and secured the establishment of associations for its advancement in different parts of the country, and in turn gave birth to this American Pomological Society.

Gentlemen,—In behalf of the Massachusetts Horticultural Society, at whose kind invitation you have assembled in this place, and at the request of its worthy President, I bid you welcome to their hall and to their hospitalities.

In behalf of the government of this association, and in my own behalf, I congratulate you upon the preservation of our lives and health, and upon other propitious circumstances under which we meet. To some of these, I will briefly advert when I have complied with that provision of our constitution, which requires your presiding officer "to deliver an address on some subject relating to pomology at every bi-ennial meeting."

In fulfilment of this trust, you will not, I presume, expect from me at this time a scientific treatise. I shall only offer a few practical suggestions, which personal experience and observation have awakened, and which may serve as hints to subjects for your enquiry and discussion. If any of these should evolve topics which you deem of sufficient importance to justify their assignment to special committees, with authority to prosecute the same, I recommend that their results should be reported, from time to time, to the executive committee, who may publish them in the form of *ad interim* reports.

Here, however, I cannot refrain from alluding to the great importance of publishing, under the sanction of this Society, none but the most reliable results, and of recommending for general culture only such varieties of fruit as are approved by long, uniform and general experience—since your imprint will involve the integrity and honor of the Society both at home and abroad. One error may produce incalculable mischief. Recommendations from you may induce the cultivation of an unworthy variety; and when the mistake is once made, its correction will prove like the attempt to recall words cast upon the wings of the wind.

Of this evil, a single illustration will suffice. Many of us remember the glowing representation given of the Monarch Pear. Whatever specimens of this fruit there may have been originally in the possession of Mr. Knight, the variety probably either never passed from his hands or was immediately lost to the world. Yet this has been disseminated and lauded as exceedingly, valuable down almost to the present time, disappointing the expectations of cultivators both in Europe and America. Mr. Knight acknowledged that a false variety had been issued, and regretted the error more than the loss of ten thousand pounds sterling. After his death, scions of what purported to be the *true* sort were obtained from the London Horticultural Society, over which he so long presided; but strange to relate, both of these proved identical, and the Monarch Pear lost the supremacy which its name indicates. But who can calculate the loss

of time, labor and money by these false issues, or erroneous representations?

Great evils have resulted, and still result, from undue haste or extravagance in recommending novelties in horticulture.—Hence great caution and reserve should be exercised by this Society, its auxiliaries, and all their official authorities.

My next suggestion relates to *the production from seed of new varieties of fruits adapted to particular localities, or to general cultivation.*

The immense loss to American cultivators, from the importation of foreign varieties, in many instances not well adapted to the countries from which they come, and often still less adapted to our soil and climate, suggests the importance of raising from seed, native sorts which, in most instances, possess peculiar advantages. It is now generally conceded that the trees and plants of a given country, like its aboriginal inhabitants, will flourish better at home than in most foreign localities.

We rejoice that public attention has been turned to this subject by some of our horticultural journalists, and that many cultivators and amateurs are engaged in this interesting and promising department. The success which has crowned their exertions affords great encouragement to perseverance. Witness, for instance, thirty or more varieties of the cherry, by Dr. Kirtland, of Ohio, which appear adapted to our eastern climate, and some of them of superior excellence. Witness the numerous varieties of the raspberry, by Dr. Brinckle, Ex-President of this Society, of which, some have endured, without covering, the severities of the last winter in the NewEngland States, and which also promise to be valuable contributions to American pomology. In addition to these, how many new varieties of the apple, the pear, the plum, and the grape have recently been added to the list of American fruits! How many new and excellent varieties of the strawberry have appeared since the introduction of Mr. Hovey's Seedling's!

These are sure indications of the success which will reward future efforts to obtain valuable and native varieties of fruit; and they point to the fulfilment of the prediction of the celebrated Van Mons, "that the time will come when our best fruits will be derived from seedlings." He gives the following sage counsel to his correspondents, to whom he had sent trees:—"*Sow your seed and persevere without interruption, and you will obtain even better fruit than mine.*"

Among pioneers in this department, I am happy to notice a gentlemen, (now residing among us) the pupil and friend of Van Mons, one who has adopted our country as his future home, and who has already transplanted to our soil many thousand choice seedlings of the pear which have come into his possessions from the collections of that gentleman and the celebrated Esperen: [Refering to Mr. Berckmans.]

As to the best method of producing fine varieties from seed, the opinions of distinguished pomologists are not uniform.

Duhamel, among the French, from causes which seem to us irreconcilable with nature and experience, entertained serious doubts of the practicability of any method for obtaining new and valuable varieties from seed, especially of the pear, because he had tried various experiments without success, for fifty years.

Dr. Van Mons, of Belgium, instead of saving the seed of the *finest* varieties, selected those of inferior sorts, upon the principle that a kind having arrived at the highest state of perfection must deteriorate, while an inferior one would improve by successive reproductions. He also held that hybridization tended to degeneracy and imperfection. Thus he assumes the doctrine that a perfect variety necessarily deteriorates, and also overlooks the fact observed by other distinguished men, that the improvement or deterioration of which he speaks, may result from natural impregnation by the pollen of other varieties conveyed by the air or insects, and therefore that the seed of a good variety may produce either a better or a worse, and that of a bad either a worse or a better.

Mr. Knight's system of obtaining new and improved varieties, depended entirely on hybridization or artificial impregnation

so lightly esteemed by Dr. Van Mons.—This is somewhat difficult to practice on account of natural fertilization by insects and the wind; but it has the merit of depending on a truly philosophical principle, and with very particular attention may yet prove as available for the improvement of our fruits as it has for the production of fine varieties in the vegetable and floral kingdom, or as the corresponding principle has in the crossing of the breeds of domestic animals.

The results of Mr. Knight's experience disprove the tendency to degeneracy, inasmuch as many of his fruits, obtained by hybridization, are among the most durable and hardy varieties, as the Eyewood and Dunmore Pears; the Black Eagle, and other Cherries.

Many cultivators, as Esperen, Bivort, Berckmans, and others, both in this and foreign countries, have sown seeds of valuable sorts. But I am confirmed in the opinion, that the best means of producing new and excellent varieties, suited either to general cultivation or to particular localities, is to *plant the most mature and perfect seed of the most hardy, vigorous, and valuable sorts*; on the general pathological principle that like produces like, and upon the conviction that immature seed, although the embryo may be sufficiently formed to vegetate, yet not having all its elements in perfection, it will not produce a vigorous and healthy offspring. Dr. Lindley, commenting upon this practice, justly remarks—"All experience shows that in every kind of created thing, be it man or beast, or bird, the mysterious principle, called life, remains during the whole period of existence what it was at first. If vitality is feeble in the beginning, so it remains.—Weak parents produce weak children, and their children's children are weaker still, as imperial dynasties have sadly shown." With him we believe this theory as applicable to the vegetable as the animal kingdom. May not a disregard of this doctrine account for the great number of feeble, sickly, early defoliated trees often found in our grounds by the side of those that are vigorous, healthful, and persistent in foliage? Is not the theory we advocate as important in the production of fruit trees, as in the raising of cereal grains?—The skilful agriculturist saves the best seed of his various crops, and selects the best animals from his flocks and herds for breeders. Why should not this law of reproduction regulate the practice of the pomologist as well as of the farmer? Has the All-wise and Infinite enacted several laws where one would subserve the purpose?

To the doctrine of Van Mons, and other distinguished writers, respecting deterioration by age, and after a variety has reach its perfection, there seem to be some exceptions. From the accounts of oriental travellers, may we not believe that the grapes of Eschol are as perfect now as when the chiefs of Israel plucked their rich clusters three thousand years ago?—and that the same variety of the fig, the olive, and the pomegranate are as perfect in Syria to-day as in the period of David and Solomon? It is worthy of enquiry whether the native grapes, on the banks of our rivers, have deteriorated since the day when the red men of the forest refreshed themselves with fruit from those vines, and whether, the orange, the lemon, the banannna, and the fruits of southern latitudes evince any more signs of decay than they did centuries ago? In a word, whether this doctrine of deterioration is as applicable to the *native* as to the foreign fruit of a country?

Why may we not expect to obtain natural varieties of the apple and other fruit as durable and far more valuable than those which have passed their second centennial, as the Endicott and Stuyvesant Pears?—From meteorological or other causes, which we do not at present understand, particular varieties may deteriorate in a given locality, for a season, and afterwards revive; or, they may show signs of decay in one locality and flourish well in others not very remote, as the White Doyenne which has been considered, for many years, by some in this vicinity, on the decline, while it is perfect in several places in Maine, New Hampshire, Vermont, and other States. Fruit-bearing may exhaust the vital energy

of the tree, and hasten decay, but still the variety may remain. We have, among fruit trees, no example of longevity equal to that of the new Taxodium, found in California, supposed to be three thousand years old. Our object is not to controvert the opinions of those who believe in the running out of varieties, whether their duration be limited to one hundred or one thousand years, but to enforce the importance of raising new varieties from seed, especially adapted to our own location.

We pass, in the next place, to the *arts of cultivation*.

In the presence of so many scientific and practical cultivators, I need say on this topic nothing more, and surely can say nothing better, than to announce the principles of your practice and the results of your experience, as promulgated by the press.

The absolute necessity of proper preparation, and deep and thorough cultivation of the soil, especially for certain fruits, is now generally admitted, though regard must always be had to the natural activity in the sap of the species, and to the degree of fertility of the soil. Surely it would be unwise to apply the same cultivation to the peach and the cherry, as to the apple and the pear, or to treat any of these on new and fertile grounds as in old and exhausted lands.

The influence of soils is remarkable. But by these we do not mean the identical spot, the artificial bed in which the tree stands; for, in time, the roots take a wide range in search of food. Some fruits are good in nearly all places; others, only in their original locality. Some succeed best on light, loamy, or sandy soils; others, in stiff clayey soils. In the latter, many pears, for instance, the Beurre Bosc and Napoleon, are astringent, while in the former they are entirely free from this quality. The Beurre Rance, in England and in some parts of France, is the best late pear. So it is, also, in some of the soils of Belgium; while with others, and with us, it is generally inferior.

The flavor of fruit is much influenced not only by soil but also by climatic and meteorological agents. Thus, in a cold, wet and undrained soil, disease commences in the root; and, as a natural consequence, the juices of the tree are imperfectly elaborated, and unable to supply the exigency of the fruit. Even injurious substances are taken up. A plum tree has been known to absorb oxide of iron, so as not only to color the foliage, but also to exude and form incrustations on the bark, and finally to kill the tree. As an instance of climatic agency, it is sufficient to report the fact, that out of fifty varieties of American peaches grown in gardens at Chiswick, England, only two were adapted to the climate.

In relation to *appropriate fertilizers for fruit trees*, a diversity of opinion prevails. All agree that certain substances exist in plants and trees, and that these must be contained in the soil to produce growth, elaboration and perfection. To supply these, some advocate the use of what are termed *special* manures; others ridicule the idea. We submit whether this is not a difference in language, rather than in principle; for by *special* fertilizers the first mean simply those which correspond with the constituents of the crop. But are not the second careful to select and apply manures which contain those elements? and do they not, in practice, affix the seal of their approbation to the theory which they oppose? Explode this doctrine and do you not destroy the principle of manuring, and the necessity of a rotation of crops?—Trees exhaust the soil of certain ingredients, and, like animals, must have their appropriate food. All know how difficult it is to make a fruit tree flourish on the spot from which an old tree of the same species has been removed.

The great practical question now agitating the community is: How shall we ascertain what fertilizing elements are appropriate to a particular species of vegetation? To this, two replies are rendered. Some say, analyse the crop; others, the soil. Each, we think, maintains a truth; and both together, nearly the whole truth. We need the analysis of the crop to teach us its ingredients, and that of the soil to ascertain whether it contains those ingre-

dients; and if it does not, what fertilizers must be applied to supply them. Thus, by analysis, we learn that nearly one quarter part of the constituents of the pear, the grape, and the strawberry consists of potash. This abounds in new soils, and peculiarly adapts them to the productions of these fruits, but having been extracted from soils long under cultivation it is supplied by wood-ashes or potash, the value of which has of late greatly increased in the estimation of cultivators.

Among the arts of modern cultivation, universal experience attests to the great advantage of *mulching* the soil around fruit trees, as a means of fertilization and of preservation from drought in heat so common with us in midsummer. In illustration of this, experiment has proved that on dry soils, where the earth has been strown with straw, the crops have been as large without manure, as with it, where evaporation has disengaged the fertilizing elements of the soil.

On the various systems of *pruning*, upon which so much has been written, I cannot enlarge. But when I consider the profound philosophy involved in this branch of our subject, I freely confess my inability justly to represent my own impressions, or faithfully to report yours. I shall only mention a few general principles. It is a doctrine of physiology, applicable alike to animals and plants, that the power of production depends upon vital energy; and this again, on sustenance. Hence, a tree can support only a given amount of perfect fruit. If from a superabundance of fruit spurs there be a deficiency of organizable matter to sustain inflorescence and perfect fructification, the fruit will be either imperfectly formed or prematurely drop from the tree. Of this, we have many forcible illustrations of varieties which bloom abundantly without setting their fruit; or which bear full crops only in alternate years. The remedy for these evils, provided the soil is properly fertilized, and other circumstances are propitious, is judicious pruning. In such instances, it is important to remove a part of the fruit spurs; or if there be a redundancy of fruit, to thin it out by picking off the inferior specimens. This latter practice is as important in fruit growing as in the cultivation of vegetables. All concede the importance of maintaining the co-relation of the different parts of the tree and of preserving the equilibrium between the top and the root. Cultivators of great celebrity remark that "it is easy to perceive what division of the root is suffering by the appearance of the branches; if the top dies, the tap or taps are sickly; if the lateral branches die then the lateral subdivisions of the roots are dead."

In relation to *summer pruning*, I will only add that as the roots and leaves are the principal organs of the tree, the only ones, in fact, of which the functions are active, it is necessary to preserve great caution, and to exercise much scientific skill.

There is one other subject to which I can only allude; the necessity of regarding the *affinities* between different varieties, in the arts of multiplication. All perceive the importance of this in the different species and genera of fruit trees. Why is it not reasonable to regard it in some measure in the varieties? It is surprising how varieties are affected in their growth by a congeniality or incongeniality between the stock and the graft. May not these affinities or non-affinities affect the quality of the fruit as well as the growth and longevity of the tree?

We suggest whether in the arts of multiplication there should not be a more careful regard to the various families; for instance, in the pear, whether the Doyennes should not be grafted or budded on the Doyennes, the Bergamots on the Bergamots, and the like.

We believe that much of the degeneracy which has been attributed to natural deterioration, or the running out of varieties, may have resulted from an injudicious selection of scions. Experience prefers those from a vigorous shoot near the top of a healthy tree, "of good, strong, healthy kinds, with a sound constitution;" since, as a distinguished cultivator remarks, there vitality is strongest, and light and free air exert their most salutary influence. The same writer cautions us against taking them from decay-

ed or unhealthy trees, or from those impaired in vitality or growing in bad soil, or in an unfavorable location, "as such are likely to produce sickly successors, themselves to become prematurely decrepid."

In regard to the various maladies of trees, and in respect to insects injurious to vegetation, we have no time to enlarge. On these subjects, we requested a communication from Dr. Harris, Professor of Entomology, which I have the pleasure to submit with this address, a gentleman from whose researches and publications the public have already derived inestimable advantages.

The diseases of fruit trees may be resolved into two classes, the natural or spontaneous, and the accidental or contagious. These should be carefully distinguished, and their symptoms considered, to ascertain their primary cause, and to determine whether they are local or general, whether they affect the whole tree or a part of it, as the root, the branches, or the fruit. Researches in this department should be encouraged by the general belief that there are few, if any, diseases of vegetation, for which there is no remedy.

There is but one other topic to which I will advert,—*the preservation and ripening of fruit.*

Much progress has been made in this art within a few years, and important results have been attained. The principle has been settled that the ripening process can be controlled. Autumnal fruits have been kept and exhibited the succeeding spring. We have seen the Seckel, Bartlett, and Louise Bonne de Jersey pears, in perfection in January, and even later. The maturity of fruits depends on saccharine fermentation. This is followed by other fermentations, as the vinous and acetous. To prevent these, and preserve fruit in all its beauty, freshness, and flavor, the temperature must be uniform and kept below the degree at which the fermentation or the ripening process commences. Our remarks, like our experience, have special regard to the apple and the pear, though the principle is doubtless susceptible of a more extensive application. Fruits, designed to be kept for a considerable time, should be gathered with great care some days before the ripening process commences, especially summer pears. A summer pear ripened on the tree is generally inferior. In respect to the latter, Mr. Barry, Editor of the Horticulturist, has so aptly expressed my own sentiments, that I use his language. "The process of ripening on the tree, which is the natural one, seems to act upon the fruit for the benefit of the seed, as it tends to the formation of woody fiber and farina. When the fruit is removed from the tree, at the very commencement of ripening, and placed in still atmosphere, the natural process seems to be counteracted, and sugar and juice are elaborated instead of fibre and farina. Thus, pears which become mealy and rot at the core when left on the tree to ripen, become juicy, melting, and delicious when ripened in the house." Various fruit houses have been built both in this country and in Europe; and experience shows that their object can be attained only by a perfect control of the temperature, moisture, and light. Hence, they must be cool, with non-conducting walls, or with exterior and interior walls, or a room within a room. Thus the external atmosphere, which either starts the saccharine fermentation or conveys the agents which produce it, can be admitted or excluded at pleasure. It is possible, however, to preserve the temperature at so low a degree and for so long a time as to destroy, especially with some varieties of the apple and pear, the vitality, and therefore all power, ever to resume the ripening process. Experience proves that for the common varieties of the apple and pear, about 40° of Fahrenheit is the temperature best suited to hold this process in equilibrium.

The proper *maturing* of fruit thus preserved, demands skill and science. Different varieties require different degrees of moisture and heat, according to the firmness of the skin, the texture of the flesh, and the natural activity of the juices. Thus, some varieties of the pear will ripen at a low temperature and in comparatively dry atmosphere, while others, as the Eastern Beurre, are improved by a warm and humid air.

Some varieties of the pear, ripening with difficulty, and formerly esteemed only second rate, are now pronounced of excellent quality, because the art of maturing them is better understood.

But so many experiments have been tried, or are in progress, and so much has been written on this branch of our subject, that I need not enlarge except to say that the art of preserving and ripening fruit in perfection, involves so much scientific knowledge as to require great attention and care; and, until its laws are more fully developed, must be attended with considerable difficulty. I therefore commend it to your special attention, as second in importance only to the raising of new varieties.

But I will not prolong these remarks. Your own observations and experience will readily suggest other felicitous illustrations of the principles to which I have adverted. I will merely re-affirm what our Friend Thomas has so justly asserted, "that fruit and fruit trees in all stages of their existence need care and attention." I will add, also, that here, as in every other department of cultivation, *eternal vigilance is an indispensable condition of success.*

Gentlemen: The facilities afforded us for the promotion of pomological science, should animate our exertions and encourage our hopes. Never before have cultivators of the soil enjoyed equal opportunities for the acquisition of knowledge, for its rapid and extensive diffusion, and for the advancement of those arts which contribute so much to the refinement and social happiness of mankind.

The age in which it is our good fortune to live, is indeed eventful—so infinitely superior to all that have preceded it, that we seem to have issued from relative darkness into the dawn of a brighter day. We begin to see where we are, what cheering prospects are before us, and to anticipate the glorious destiny that awaits us.

I congratulate you upon the opportunity the present occasion affords for the interchange of cordial salutations, and of that personal experience which make the knowledge of one the property of all,—upon the variety of our soil and climate, which enables us to produce nearly all the fruits of ef the civilized world,—upon the progress of the arts of cultivation, and of a knowledge of the principles upon which those arts depend,—upon the increasing interest of all classes of society in the growth of fruits, and the number of fine varieties which have recently been added to our lists,—upon the skill displayed in rural architecture and landscape gardening in the suburbs of our cities and throughout our land,—and upon the multiplication of societies and periodicals, which invite the lovers of nature to participate in the blessings which flow from rural life and cultivated taste.

If our present exhibition of fruits is less extensive than it would have been but for the remarkable drought, yet could our Puritan sires examine it, with what astonishment would they be filled! For instance, could Governors Endicott and Stuyvesant inspect our collection of pears, with what pleasure would they look back to the planting of the trees that still live and bear their names. And with what eloquence would they exhort us to perseverance, that our names also may go down to posterity honorably associated with the fruits of our labors!

But much remains to be accomplished. Improvements may hereafter be made more remarkable than any which have hitherto astonished mankind. Implements of industry may yet be invented still further to facilitate our labor, and to relieve its severity. Natural laws may be discovered, upon which arts of a more successful cultivation may be founded. Remedies and agents may hereafter be discovered and applied for the cure of the diseases and for the destruction of the insects at present so injurious to vegetation. All these are not only possible, but probable; for in the very constitution of our minds and of the material world, our beneficent Creator has provided for endless progress, and for a continual approach toward his own unapproachable perfection.

But how much study and experiment are requisite before we can touch the magic

spring which shall reveal these wonders to our perception! We have no prophetic eye to look down the vista of ages and to discover the future; but judging from the past, what incentives encourage our perseverance!

Gentlemen, go on. Prosecute the work you have so honorably commenced. Sow the seeds of your best fruits,—raise new varieties,—ply the arts of judicious cultivation,—study the laws of nature, and extend your researches and labors, till our beloved land shall be adorned with orchards, vineyards and gardens; and man shall realize the poet's idea of Paradise regained!

Transplanting Trees, Roses, Shrubs, and Evergreens, in the South.

The following article from the "South-Carolinian," of Columbia, will be of interest to most of our readers. Ordinarily we consider November the best time in this latitude for transplanting. In the beginning of November, 1853, we transplanted, among other things, peach and fig trees, four years old, all of which rooted finely and bore abundant crops of fruit the following summer. But we agree with Messrs. Summer & Crammond, that this year the result would have been very different. Persons following their directions will rarely, if ever, fail in getting trees to live.—*Alabama Planter.*

"From an article recently published, we observe that November is recommended as the proper season to transplant fruit trees. Some seasons this month would do, but the present year the transplanting of fruit trees and roses would have been extremely hazardous, for we have not, as yet, in Middle South Carolina, had a frost sufficiently severe to cheek vegetation completely. Our young trees and roses took such a strong growth, after the extreme hot weather ceased, that it will take at least till the 25th of November to fit them for transplanting. A tree should never be taken up whilst it will visibly shrink upon removal. We have no criterion in the dropping of the leaves of the forest trees, as the origin of forest trees is so various, that many kinds require a certain degree of cold to stop their growth. Young nursery trees, too, being well cultivated, hold their leaves longer and grow more luxuriantly than fruit-bearing trees in orchards—so the proper time to transplant is, whenever the juices of the tree become inactive. A dry summer, with an extreme degree of heat, followed by a delightful and seasonable autumn, prolonged into the heart of winter, has with us added a third more wood of late growth to trees, and has, at the same time, delayed the season for transplanting.

In South Carolina, we find no difficulty in transplanting trees and shrubbery from November 25 to as late in the spring as we can retard the leaves. Trees should never be touched when the soil is frozen. The milder and drier the weather in winter, the better success will be had.

We dig our holes. After ploughing the land as deeply as we can, twelve inches deep and at least five feet in diameter. We half fill these holes with good, rich vegetable compost, broken bones, etc., and then place the tree in its proper position, the earth in the hole being a little more elevated immediately under the trunk. We then place the roots so that they are arranged in every part of the hole, when it is filled up carefully with a similar compost. The tree should not be planted nore than one inch deeper than it stood in the nursery. When the hole is about three parts filled, we pour gently around the stem about five gallons of water, after which the operation is finished by completely filling it up, and making a slight mound around the trunk. We never pack in the earth around a tree, as the water will consolidate it sufficiently around the roots to make it grow. This watering will be all the tree will require, if it be properly mulched with leaves, straw, saw-dust, or old tan-bark. If trees have been well soaked six hours before planting, and we have frequently revived such as were to all appearances dead, by burying them entirely in the earth for ten days, after having restored vitality to the bark by soaking them in water. The trunks of all newly transplanted trees should be protected from the sun. A bunch of brokom sedge, so common everywhere is the very best material.

We head in all trees severely, no matter how fine the roots may be. Bearing trees should be prepared for removal one year previously, by cutting in both the heads and roots; but, at best, the removal of large trees in the South is hazardous and unprofitable. Stakes to trees are useless. When a tree will not stand erect, it should be manured and cut in, till it acquires sufficient vigor to stand alone. We would as soon think of tying a baby to a stake to make it stand, as a tree. The knife and food is all a tree requires to keep it erect and vigorous. Until newly planted trees are firmly rooted, they should be regularly inspected and straightened up. When watering is necessary, the earth should be removed for a few inches from the tree, and the water poured gently around the trunk, till the earth in the vicinity of the roots

absorbs it. This should be done in the evening to be effective, and the small hole made should be carefully filled up the next morning by sunrise, with loose mellow earth, after which the mulching should be placed around the tree. When the buds of a newly planted tree are dormant and late starting, we frequently found that an additional watering of the limbs and trunk immediately roused them into active growth. In fact, by wrapping the stem and limbs of a valuable pear tree, the roots of which had been destroyed by rats on shipboard, with rags, and regularly moistening them, we preserved the variety, and induced the tree, which had not a vestige of fibrous roots left, to live and flourish. It is now as vigorous as need be, and its roots have spread as widely as its top.

For transplanting roses, evergreens, and shrubbery, we should advise the deep and thorough preparation of the soil throughout the whole plat, and then plant much in the same manner as directed above for fruit trees. Roses and deciduous shrubs, and such evergreens as do not belong to the *Coniferæ* and cypress families, should have their heads well cut in. The *Pinaceæ*, embracing the suborders of *Abietæ* and *Cupresseæ*, and in which are comprised the Firs, Cedars, Arbovitæ Cypresses, Larches, and all resinous evergreen trees, together with the yews, do not require much pruning, when transplanted, as it must be done when the trees are very small. The holly, both native and foreign, and which, under proper culture, is a beautiful evergreen tree, requires great cutting in when transplanted. All land, before planting trees, should be thorougly drained.

SUMMER & CRAMMOND.

Pomaria, S. C.

REPORT FOR 1854.

Of the President of the American Wine-growers' Association.

The Winter and Spring frosts injured the vines to a considerable extent. The favorable weather of May, induced a fine growth, and the blossoms appeared from the 18th to the 26th, promising a good crop, and hopes of renumeration for the arduous labors of the vineyard, which were, however, destroyed by the continued rainy weather and thick fogs which lasted until the 16th of June.

The injury occurred in the form of mildew and rot—the first appeared along the river about the 6th of June, and upon my own place and vicinity, (on the hills,) on the 14th. The disease prevailed to such an extent that some vineyards did not produce one-tenth as large a crop as last year.

The mildew is a Fungus or cryptogamic plant, apparently Erysipha necatricis, described by Schweinitz in the annals of the Philosophical Society for 1834, and allied to the Oidium which has made such terrible destruction in the vineyards of Europe. After heavy fogs, the stems and berries appear to be covered with a white meal, they soon afterward dry up, but single berries that have escaped, may ripen, provided the main stem of the bunch have escaped the influence of the disease, which is sometimes confined to a few scattered berries, to a shoulder, or to the extremity of the bunch.

The disease here called *the rot*, appeared about three or four weeks later than the mildew. The half-grown berries have brown rusty spots under the epidermis, then they dry up.

Vegetable Physiology, aided by the powerful microscope, has not yet been able to trace the cause of the appearance of these Fungi on plants, nor has Chemistry yet furnished us a remedy for them. Professor Mohl of Tubigen, showed that the Oidium brought on the destruction of the fruit by the mode in which it was affixed to the epidermis.

I give you with pleasure, the experience and experiments I have made during the year in my home vineyard of about 2,000 vines, which have been under my own immediate care. These I have closely watched, in the hope of receiving more light upon the diseases of vines and their prevention. Like the judicious physician who would treat a human subject, we must endeavor 1st, to discover the kind of disease, and 2ndly, its cause, which last, being removed, the former is generally cured.

This vineyard is laid out in 100 rows, each having twenty vines; it is on a ridge, running from North to South, two-thirds of the surface inclines slightly toward the East, the remainder falls off to the South. This third, containing 615 vines, upon which no mildew or rot was observed, yielded

sixteen bushels of fine full-grown grapes, whilst the other two-thirds, with 1,385 vines, furnished only six bushels. It will puzzle any one to suggest the cause for this great difference in productiveness and the absence of the mildew and rot. Hear the explanation. In this portion of the vineyard, I last year sunk some under-drains to prevent its washing — let us explain the effects of this upon the vines and their products.—The soil around Cincinnati, to the depth of a foot or more, is calcareous clay, with the usual amount of decayed organic matter, silicious or sandy particles, &c. Below this, are alternating layers of clay, from six inches to ten feet or more in thickness, and limestone rock from half an inch to twelve inches in the thickness of its strata, constituting the local development of the lower Transition formation — [*the silurian*] In this vineyard the upper soil is deep, for in digging fourteen feet I did not reach a layer of the limestone.

Our clay soils retain the cold underground water, [water of saturation] too long, which having no possible outlet below, must escape by capillarity in response to the superficial evaporation; hence, the warm spring rains, highly charged with many nutricious matters, can neither penetrate the soil with their fertilizing properties, nor raise the temperature of the lower portions with their genial warmth, which is wanted by the deep roots, then sending out new fibers and spongioles to gather nutriment for the growing wants of the upper portions of the plant. Their labors are thus thrown upon the upper roots exclusively, which are liable to suffer from drought, such as this year extended from the middle of June until October, and dried them up completely.

The wet weather of May induced a vigorous growth of the vines, and the continued showers and fogs greatly injured the blossoms, checking their proper impregnation and the healthy growth and assimilation of the vines; the thickness of the damp atmosphere checked the necessary evaporation of water from the leaves, which s the natural arrangement for drawing up nourishment from the soil, and thus producing stagnation of the sap, and the mildew followed as a necessary consequence. From the middle of June until the end of July we had excessively hot weather, the upper roots being exposed to the hot sun soon dried up, and, as already mentioned, the deeper fibers not having been brought into action in due season, were unable to supply the needful nutriment, and consequently the rot occurred, as a result of a deficiency of proper food. These facts will be confirmed by Mr. G. Sleath, who had a fine crop this year, on those portions of his vineyard that had been underdrained; also, by Mr. R. Hodge, and T. V. Peticolas, whose vineyards are underlaid by a porous, sandy sub-soil, effecting the drainage necessary to carry off the superabundant waters.

L. REHFUSS.

The American Pomological Society.

[The following account is from the Boston papers, and will be read with interest before the official report would be presented. Ed.]

The American Pomological Society held its sessions in Horticultural Hall, School st., Hon. M. P. Wilder, President, in the chair. Large numbers of delegates were in attendence, and nearly every State in the Union was represented. It was a pleasant thing to witness the hearty congratulations which were exchanged between members whose only strife with each other is to see who will best advance the interests of Pomological science, and who will shed the most light upon the great subject of fruit culture in America.

The President welcomed the delegates to this city, the home of the Pilgrims, in a most cordial manner. He eulogized our forefathers for their horticultural taste, and their worthy endeavors to lay the foundation of American pomology.

He tendered to the members the hospitalities of the Massachusetts Horticultural Society, and congratulated them upon the preservation of life and health, and the increasing interest manifested in the cultivation of fruits throughout the country.

He discussed several topics, giving the

results of his long and valuable experience in a scientific and felicitous manner.

Mr. Wilder also discussed the arts of cultivation, the affinities and the non-affinities of the stock and graft, the art of preserving and maturing fruits. The latter he deemed of the greatest importance, and but imperfectly understood.

On motion of Col. Henry Little of Maine, a nominating committee of one from each State, represented by delegates, was appointed by the President to nominate officers for the next term. The following gentlemen were appointed on the committee:—

Col. Henry Little of Maine, B. F. Cutter of New Hampshire, Hon. J. S. Cabot of Massachusetts, (President of the Massachusetts Horticultural Society), C. B. Lines of Connecticut, P. Barry of New York, J. M. Hayes of New Jersey, Dr. Wm. D. Brinkle of Pennsylvania, Samuel Feast of Baltimore, E. S. Hull of Illinois, E. Abbot of Missouri, B. F. Nourse of Florida, and Joshua Pierce of District of Columbia.

Col. Little resported as follows:—

For President, Hon. Marshall P. Wilder. For Vice Presidents, Caleb Cope of Pennsylvania, A. H. Ernst of Ohio, S. L. Goodale of Maine, Col. B. Hodge of New York, Lawrence Young of Kentucky, H. J. French of New Hampshire, Frederick Holbrook of Vermont, Samuel Walker of Massachusetts, Stephen H. Smith of Rhode Island, Dr. A. S. Munson of Connecticut, Thomas Hancock of New Jersey, E. Tatnall, Jr. of Delaware, William C. Wilson of Maryland, Yardley Taylor of Virginia, Joshua Pierce of District of Columbia, Joshua Lindley of North Carolina, Robert Chisholm of South Carolina, Richard Peters of Georgia, C. A. Peabody of Alabama, B. F Nourse of Florida, Thomas Affleck of Mississippi, Henry E. Lawrence of Louisiana, Rev. C. H. Byington of Arkansas, Thomas Allen of Missouri, James Grant of Iowa, N. P. Talmadge of Wisconsin, W. L. Haylay of Illinois, Henry L. Ellsworth of Indiana, D. W. Yandell of Tennessee, Dr. Henry Gibbons of California, Edward Hunter of Utah, James Dougal of Canada West, and Hugh Allen of Canada East. For Secretary, H. W. S. Cleveland of New Jersey. For Treasurer, Thomas P. James of Pennsylvania.

This report was accepted. Mr. Wilder, on assuming the duties of the chair for the ensuing term, addressed the Society briefly. He remarked:—

Gentlemen,—I am not of the number who, having put hand to the plow, are disposed to look back, but I freely confess that it has been my inclination and desire (at this time) to retire finally from the chair. Having held the office of President for two biennial terms, I felt it due, alike to myself and you, to resign this position to other members equally or better qualified to perform its duties. But at the instance of those whose opinions I feel bound to respect, I have consented to waive my private convenience and personal comfort in favor of their judgment,—and thanking you for this renewed testimony of your confidence and regard, I accept the trust, and will meet its responsibilities as far as I am able.

All persons present interested in the objecs of the society, whether members of any horticultural society or not, were invited to take seats with the society and participate in its doings.

The President appointed the following committee to report " Business for the Convention:"—Messrs. Walker of Massachusetts, Barry of New York, Keyser of Pennsylvania, Nourse of Florida, and Eaton of (Buffalo) New York. Mr. Walker subsequently reported as follows:—

Presuming that the session of the convention will be continued during three days, the committee recommend that the order of business shall be for the first day the discussion of the Pear; 1st, the rejection of unworthy varieties; 2d, varieties for general cultivation; 3d, varieties which promise well; 4th, varieties on quince. For the second day, Apples, and after that, Peashes, Plums, and other fruit.

Reports of the fruit committee from the different States were now called for, and Mr. Samuel Walker of Massachusetts, submitted a report containing a list of pears which it was recommended should be rejected. A general discussion ensued on this report, in which Messrs. Cabot, Hovey, King, and Walker of Massachusetts, Barry of New York, and Prince of Long Island, took part.

On motion of Mr. Hovey of Boston, the President proceeded to read the list of pears on Mr. Walker's list, and that the varieties should be rejected unless three members object. The following pears were retained on the list for further trial:

Beurre Adam, De mortier of Manning, Duchesse de Mars, Figue de Naples, Flemish bon Chretien, Hacon's Incomparable, March Bergamot, Knights Monarch and Styrian.

In reference to Knight's Monarch, Mr. Walker remarked that he believed more money had been expended on that fruit than on any variety in the country. He never raised a good specimen—at least he never ripened one. It is not only an uncertain fruit, but cracks badly. As to ripening it in this section, he believed it to be totally impossible.

Mr. H. Lines of Connecticut, said it seemed to him to be an imposition upon the public to recommend the Knight's Monarch pear. The object of the society was to benefit the public throughout the country, by recommending the cultivation of none but good fruits ; the society had better turn their attention to the rejection of poor varieties than to increase the list.

Mr. Hancock moved a reconsideration of the vote, whereby the Monarch pear was permitted to stand on the list.

Hon. B. V. French, Mr. Knight, and Mr. Thompson, of New London Horticultural Society, spoke highly of the Monarch. The tree is thrifty and is a good bearer. Considering the high character of the fruit in England, and the strong recommendations which have accompanied it, Mr. Thompson was willing to try it a little longer. After some fnrther discussion, the Knight's Monarch was retained upon the list.

Mr. Walker submitted the following list of varieties to be added to the list of pears worthy of general cultivation· Lawrence, Howell, Beurre Superfine, and Beurre d'Anjou.

Mr. Walker remarked that he considered the Lawrence pear as one of the greatest acquisitions to our list of pears since he had been engaged in cultivation. Among the new varieties he knew nothing equal to it. Mr. Prince stated that the Lawrence pear would be as eagerly sought after in Boston and New York markets a the old Saint Michael was. The tree is thrifty, and has an abundance of foliage. Another property peculiar to the Lawrence pear is this: the fruit clings to the branches as though it had been tied on, reminding one of the Urbaniste in that particular. He wished that a unanimous expression should go out from the society, that the Lawrence pear is among the best late native pears in the catalogue.

Mr. Manning had known the pear for twelve years, and from his experience with it he considered it the most valuable pear that had been produced within that time.

Mr. Hayes remarked that the Lawrence pear originated on sandy soil, and would like to be informed whether it would grow well on strong soil.

The President said he had grown it on stiff, clayey soils. He entirely concurred in the general commendation that had been bestowed upon it. The Lawrence pear was then placed upon the list, as a variety worthy of general cultivation, by a unanimous vote.

The Howell pear was next considered. Mr. Menice thought it premature to place this variety on the list for general cultivation. Mr. Barry regarded it as a very fine variety, and would be willing to see it adopted in the list of pears for general cultivation. Mr. Lines said the Howell had all the qualitios of a good pear : it was large, thrifty, and of uniform growth.

Mr. Berckmans of New Jersey, was of opinion that the Howell was one of the first fruits. Mr. Clark of Connecticut had found that it grows admirably on quince. It was a very early bearer, and trees two years from the bud had fruited. He considered it a valuable variety. The President concurred with these views. He esteemed the Howell very highly, and was willing to risk his reputation by voting to place it on the list for general cultivation. Mr. Hancock moved that it be placed on the list with pears which promise well.

Mr. Hovey remarked that there was no one who knew the pear, but would say it wss a good variety. Still he had not seen enough of tha growth of the tree or of the general characteristics of the fruit to recommend it for a standard fruit. It ripened in September, when we have an abundance of varieties, which was an objection. He

would prefer to place it on the list which promise well, rather than recommend it for general cultivation.

Mr. Manning thought it premature at present to place it on the list for general cultivation, but he would be glad to see it placed on the list which promise well.

Mr. Walker would place the Howell at the head of that list. It was placed on the list of varieties that promise well.

The Beurre Superfin was next taken up. Mr. Cabot regarded it as a fruit of very great excellence. It could be kept till November or December. Mr. Prince gave on opinion highly favorable to it.

The President remarked that his opinion corresponded with that of Mr. Cobot. It had all the good qualities of the Brown Beurre, with a higher flavor.

Mr. Barry said the Beurre Superfin was one of the finest of pears,—large, hardy, aud the tree bears young.

Mr. Hovey thought the Society premature. The variety had been under cultivation but three years. His opinion was that the variety was unexceptionable, but it was also his opinion that it had not been tried sufficiently. He was willing to put it on the list that promise well.

Dr. Eshelman of Pennsylvania, would only recommend it as very good. The Beurre Superfin was placed on the list of varieties that promise well, by a unanimous vote.

The pears that have been placed on the list of varieties which promise well were now taken up, and each variety considered separately. Qnite a discussion arose on the quality of the different varieties as they were called, and the experience of members was various—some varieties proving in some locations superb, in others of no value. The discussion on this point was continued until 2 o'clock, when the Convention adjourned to meet again at four o'clock.

The Convention re-assembled at four o'clock, and the subjects under consideration at the time of adjournment, was resumed, and occupied the entire time until adjournment. Brande's St. Germain was stricken from the list, and disgraced by a unanimous vote. The Diller variety was also discharged. Manning's Elizabeth was promoted to the list for general cultivation.

The discussion on the qualities of these different varieties was quite full and very interesting.

On the next day the first business was the appointment of committees as follows:

Executive Committee.—The President and Vice-Presidents ex-officio. William D. Brinckle of Pennsylvania, B. V. French of Massachusetts, J. A. Warder of Ohio, Richard Peters of Georgia, Benj. Hodge of New York.

On Foreign Fruits.—C. M. Hovey of Massachusetts, Charles Downing of New York, C. B. Lines of Connecticut, S. L. Goodale of Maine, H. E. Hooker of New York, J. M. Hayes of New Jersey, E. J. Hull of Illinois.

On Native Fruits.—Wm. D. Brinckle of Pennsylvania, P. Barry of New York, Henry Little of Main, Robert Manning of Massachusetts, Thomas Hancock of New Jersey, J. B. Eaton of New York, B. F. Cutter of New Hampshire.

On Synonyms.—J. C. Cabot of Massachusetts, William R. Prince of New York, L. E. Berckmans of New Jersey, A. H. Earnst of Ohio, J. J. Thomas of New York, Robert Buist of Pennsylvania, F. R. Elliott of Ohio.

The President called for the opinion of the Conventien on varieties of pears worthy to be placed in the list of "Pears which promise well." After some interesting discussion, the following varieties were placed in that list: Beurre Clairgeau, Sheldon—a New York seedling; Epine Dumas, Collins, a seedling from Watertown—and the Adams, exhibted by Hovey & Co.

The Hampton pear, a seedling from Long Island, was proposed to be placed ou the list of varieties which promise well. Mr. Barry of New York had known it as the Hagerman. Mr. Earle of Worcester, said there was a pear extensively cultivated in the eastern part of Connecticut, called the Hampton; he would like to know whether it was the same. Mr. Prince of Flushing, said the Hagerman was esteemed as a very great acquisition. Mr. Baxter remarked that the original tree was found in a hedge. It is a fine growing tree, a beautiful fruit.

Dr. Brinckle of Pennsylvania, thought

he knew too little about this variety to adopt it at present. It was withdrawn to await the opinion of the Committee on Native Friuts.

The President proposed the Dallas pear, introduced by Gov. Edwards of Connecticut. At first he did not think very favorably of that variety, but latterly he had formed a very different opinion of it. It was hardy and vigorous.

Mr. Berckmans of New Jersey, regarded this variety as one of the very highest flavored pears. It has lasting qualities, and is very juicy.

Mr. Manning could not regard the quality such as to entitle it to general cultivation.

Mr. Lines of Connecticut said the Dallas pear stands very well indeed with pomologists in New Haven, although it has not made a deep impression there. It was not adopted.

The President proposed the Sterling pear. Mr. Barry did not know enough about it to give an opinion. Mr. Lines thought it hardly worth while to adopt it. The President found the tree to be beautiful, the fruit handsome and promising well. It was not adopted.

The Boston Pear, (Hovey's,) was proposed for rhe list which promise well. It was opposed by Mr. Walker. Mr. Cabot gave his experience of it. When he first tasted it, he thought it as good as the Golden Beurre of Bilboa. At other times he had seen it when he would not have known it. Mr. Earle had known the Boston pear three years, and it appeared to be better than the Muskingum or the Urbanistie. If it proved as uniform as he had fonnd it, he should think it a very good summer pear.

The President did not taste it the first year it was exhibited; the second year, however, he tried it, but it did not quite come up to his expectations.

Mr. Lines of Connecticut thought it not proper to put it on the list which promise well.

The Boston pear was rejected from that list.

Mr. Barry of New York would like to hear the opinion of the Convention on the Easter Beurre pear.

Mr. Rich of Baltimore said it did well in Maryland, and ripens without difficulty.

Mr. Barry had cultivated the Easter Beurre in Rochester for 15 years, and was satisfied that it was far the best winter pear in existence, for any place where it ripens as well as it does in Rochester. Had he the convenience, he would plant twenty acres with this tree.

Mr. Eaton of Buffalo had eaten it in perfection as late as the 22d of April, and considered it the best pear he had ever eaten. It is a good grower, a good bearer, and is unapproachable as a winter pear.

Mr. Walker said the Easter Beurre had always been a favorite with him. He learned from his friend, Mr. Berckmans, from Belgium, that the Monks always reserved the Easter Beurre for their especial palate, and he considered that a pretty good indication of its superiorty. Finer pears never were grown—better never were eaten. It is not, however, so good in this region as in other parts of the country. Mr. Walker moved that the Easter Beurre be placed among the varieties for cultivation in particular localities.

Mr. Barry said the demand for this tree is so great they cannot be obtained, either in this country or in Europe.

Mr. Wilder would like to see it placed upon the list which promise well for certain localities. Specimens had been exhibited at the Massachusetts Horticultural Society's Exhibition, weighing 14 and 16 ounces, and they had been sold as high as $1 for a single specimen. When properly ripened, 50 cents each have been paid for them readily.

Mr. Walker was inclined to think that the Easter Beurre was a little too old to be placed in the list of pears which promise well. If 50 years of practice and experience with it is not enough to enable us to determine its true position, let it die. It would be better to withdraw it altogether, than to place it in the list of varieties which promise well. We should place in that list varieties only that we are pretty well acquainted with,—new pears that have

been cultivated long enough to determine their quality.

The discussion was continued at some length by a great number of members. Various motions were offered and withdrawn, until finally, it was voted unanimously to lay the subject upon the table until the next biennial meeting; the Society, in its associate capacity, expressing no opinion.

The qualities of the following varieties of pears were briefly considered, and they were placed in the list of varieties which promise well: — Grand Soleil, Jaune De Witt, Walker, Kingsessing, Belle Noel or Fondante de Noel, Doyenne Sieule, Pius Ninth, Fondante de Malines, Beurre Sterkmans, Rousselette Esperine, Zepherine Gregoire, Theodore Van Mons, and Compte de Flanders.

Dr. Brinckle exhibited to the Convention specimens of the Latch pear, a new native; the Regnier pear; and the Graham grape.

William R. Prince, of flushing, L. I., submitted a list of thirty-three pears, which he proposed should be placed upon the rejected list:—Belle et Bonne, not rejected. Belle d'Aout— This was said to be one of the most deceptive pears in the catalogue, very handsome, but very miserable—rejected; Belle d' Bussells, rejected; Martin Sec, rejected; Beurre Van Mons, Bouquia, Calebasse of France or Pitt's Prolific, Jalousie, Leon le Clerc, Lavalle, Maria Louisa Nova, March Bergamot, Moorfowl Egg, Passane d'Portugal, Pope's Quaker, Queen Caroline, Queen of the Lower Countries, Queen of the Pears, Sugar Pear, Summer Bergamot, Summer Thorn, Swan's Egg, and Vert Longue Panache—all rejected.

. Chelmsford, Beurre d'Aremberg, Hampden, Bergamot, Mesirre Jean, Muscat Alleman, Windsor. and Bezi de la Motte—not rejected.

Mr. Stickney called the attention of the convention to the Beurre Diel Pear. It had always held a high rank with him.

Mr. Prince remarked that he sent the first Beurre Diel specimens ever exhibited at the Massachusetts Horticultural Society's tables. He sent it under the name of Colmar Souveraine. He considered it a grand pear in every respect. Other members gave their opinions. In the city of Newark it was esteemed among the best varieties; in western New York it is universally regarded as the best pear cultivated; at Worcester it is very popular, where it is mostly cultivated on quince; it is highly regarded in Maine; there is no pear in New Haven more highly esteemed. They think more highly of it for general cultivation than any other. Objections were urged that in some localities it cracks badly.

After a full discussion the Beurre Diel was placed upon the list recommended for general cultivation.

In the afternoon session the subject of apples was taken up, and it was voted to take up those apples which at the last session of the Society were placed upon the list of varieties which promise well. The autumn Bough was first on the list. Mr. Downing considered it one of the finest Fall sweet apples we have. In Newburg, New York, and its vicinity it is very fine. It was not advanced. The Hawley apple did not do well this year, but last season it was one of the finest apples. It remains on the list. The Melon apple, originated in western N. York, was esteemed worthy of recommendation for general cultivation. It ripens in November or December. There is a tree now in bearing at Mr. Stickney's farm in Watertown, with two barrels of fruit. The Mother apple remains on the list. The Northern Spy was placed on the list, recommended for particular localities.

The Smokehouse apple of New Jersey—sometimes called the Lancaster Vandervere—was esteemed in Pennsylvania and Ohio as a superior variety; but as it was not very generally known, it was permitted to femain on the list where it now stands.

Mr. Prince recommended the Garrickson's Early apple. He would also recommend the Sine Qua Non as another superb early apple.

Mr. Hooker suggested that two early apples, which he considered very fine, be added to the list of varieties which promise well—The Primate and Early Joe.

Mr. Downing and Mr. Barry supposed

the Primate to be identical with the Summer Pippin. It was highly spoken of, and was regarded as one of the best market apples cultivated. It began to ripen very early, aud continues a great length of time. It was placed on the list which promise well. Early Joe was passed by.

Mr. Little, of Maine, called the attention of the Convention to the Ribston Pippin, especially for Northern situations.

Mr. Prince remarked that it always drops its ftuit on Long Island before October, he had erased it from his catalogue; but afterwards receiving information that it had succeeded remarkably well in New Hampshire and Vermont, he restored it.

The Ribston Pippin was recommended for cultivation in Northern latitudes.

The Genesee Chief was recommended by the Committee on Native Fruits, and it was placed on the list that promise well.

Dr. Eshleman of Pennsylvania proposed to place the Jeffries on the list for trial. He considered it the best apple he had ever seen for its season—it ripens in September.

Mr. Manning considered the Minister apple the very best winter variety he ever had—particularly for strong soils. It was placed on the list for general cultivation.

The Murphy apple tree was characterized by Mr. Manning of Salem, as a poor bearer, and the tree is apt to die at the extremities of the branches. Passed over. The Monmouth Pippin was placed on the list whith promise well. The Coggswell apple, from Connecticut, a fine looking variety, about the size of the Baldwin, red, juicy, delicious, and continues until December, was placed on the list which promise well.

The Committee on Native Fruits submitted a report, the result of their examination of a variety of specimens that had been submitted to them. The report was accepted. Among the articles reported on was the somewhat celebrated Concord grape. The Committee described it as large, round, heavy bloom, dark color,—flavor more foxy than Isabella.—quality good—bunch, in size and form, not unlike tha Isabella.

Mr. Lines of Connecticut, desired to discuss the item in the report concerning the Concord grape. It was a matter of great importance to the public. There is a deep interest felt in the community in reference to any grape that promises to be a substitute for the Isabella. The vote adopting the report was reconsidered.

Mr. Lines now offered the following:—

Voted, That the Concord grape, which we have had an opportunity to examine, is evidently earlier by several weeks than the Isabella grape. It is very juicy, but is inferior in quality to the Isabella, Catawba or Diana.

Mr. Prince considered the Concord grape a decided acquisition to the New England states.

Mr. Bull, the originator of the Concord grape, gave a long account of its origin and his experience with it. It is a remarkably juicy berry, and from a heaped bushel basket he pressed 20 bottles of juice, to which he added four pounds of sugar, and now the wine is too sweet. He believed that wine could be made from it without sugar.

The discussion was continued by several gentlemen, and quite an interest was manifested in fixing the true position of this grape. Mr. Lines withdrew his vote. Some extended remarks from Mr. Walker, recommending caution in endorsing this grape, until it had been tested for at least five seasons, elicited responses from Mr. Bull, Mr. Hovey, and some remarks from Dr. Brinckle. The discussion became warm and somewhat exciting. Mr. Cabot did not understand that the Society had examined the grape, and it was not called upon to give an opinion for or against it. The members had not cultivated it, and they knew but little about it. It remained for the Society to adopt the report of the committee on native fruits.

Mr. Bull did not offer his opinion as to the merits of the Concord grape; neither did he desire an expression of the opinion of the Society.

Mr. Breck thought it proper that the Concord grape should be permitted to remain where it now stands. It should not be endorsed by the Society until it has been more fully tested.

On motion of Mr. Cabot, the report of the committee on native fruit was unanimously adopted.

On motion of the Secretary of the Society, it was voted "That the list of all the fruits now on exhibition at the Massachusetts Horticultural Society's tables, contributed by members of the American Pomological Society be entered on the record of the proceedings of the Convention."

The President submitted the report of a committee appointed at the session of 1852, to consider the subject of erecting a suitable monument to the memory of the late A. J. Downing, from which it appeared that a fund of $1,600 had been subscribed for that purpose, from gentlemen in Philadelphia, New York, Boston, Rochester, Newburgh, Buffalo, and other places. It is the design to erect the monument in the public grounds at Washington, which Mr. D. did so much to adorn.

The consideration of the varieties of apples to be recommended was resumed.

Mr. Benson of Maine called the attention of the convention to the "Winthrop Greening," known also as the "Lincoln Pippin." It is an Autumn variety, ripening in the latter part of October; is quite as large as the Rhode Island Greening, and for flavor, beauty, and the table, ranked among the very best varieties.

Mr. Goodale of Maine, thought it was an unrecognized English apple introduced by Mr. Vaughan. It was a superior variety. Placed on the list for trial.

Mr. Barry called attention to the Benoni apple, a New England variety. It has been much cultivated, but there has not been much said about it.

Mr. Walker's experience led him to be in favor of the Benoni. It originated some years ago in the neighborhood of Dedham. He should have no hesitation in saying it was a very good variety.

Mr. Prince received the Benoni from the late Mr. Manning as the best variety he had seen, and he (Prince) has found it so. He thinks it eminently worthy of general cultivation. It was placed on the list which promise well.

Col. Little of Maine, called attention to William's Favorite. It was the unanimous opinion of the Convention that it was a superior apple for general cultivation—with this qualification, it does not flourish on light soils.

Mr. Townsend wanted the opinion of the Convention as to the best winter sweet apple for cooking. There was a general expression that the Danvers Winter Sweet was a most desirable variety.

Mr. Saul never saw any apple equal to the Ladies' Winter Sweet.

Mr. Walker's experience led him to place the Ladies' Winter Sweet in the very first rank.

The President had seen it in bearing in Massachusetts. The tree was loaded with fruit as thick as onions on a string.

Mr. Manning would like to see it in the promising list.

The Convention gave a unanimous opinion that this variety is the best winter sweet apple in cultivation.

B. F. Cutter of New Hampshire, spoke of an apple in Hillsboro', called John Sweet, which he esteemed very highly, and he regarded it as the best late keeping sweet variety he ever saw.

Mr. Prince of New York, remarked in reference to the Newtown Pippin, that two distinct and very dissimilar varieties are cultivated under the same name—the Green Newtown and the Yellow Newtown. The first has a rough bark, the other has a smooth bark, and is very thrifty, while the Green is unthrifty.

Dr. Wright called attention to the Ledge Sweeting, a seeding from Portsmouth, which he had no doubt would prove as good a variety as the Ladies' Winter Sweet.

Mr. Wilder regarded the Ledge as a most remarkable apple.

Mr. Barry of New York, spoke of the Belmont apple as a very popular variety in Northern Ohio and Western New York. It is an early winter apple of large size. It fails in Illinois.

Mr. Manning had grown a few specimens, and they promised well for a good apple.

Mr. Manning called attention to the Garden Royal apple as a very superior variety

but, as it is a small grower, he would not recommend it for orchard cultivation; but, for garden, he esteemed it as one of the most desirable sorts that can be cultivated. It ripens in the latter part of August.

The President confirmed the remarks of Mr. Manning. The Garden Royal stood, in his estimation, among the best. It was recommended as good for gardening.

The discussion of apples was closed.

Mr. Prince of New York, offered the following resolutions which were laid on the table:—

Resolved, That we appreciate the wisdom and beneficence of the Creator in placing within the boundaries of our country eight distinct species of the grape, and innumerable varieties; thus providing means for the resuscitation of the human system, by the most delicious fruits and gently exhilerating beverages.

Resolved, That whilst we deprecate the use of all alcoholic liquids, and of the adulterated wines that are poured upon our shores from the Eastern Hemisphere, we cannot refrain from urging upon Americans the general culture of the grape, and the formation of extensive vineyards, in order thereby to diminish importations, increase the national wealth, and above all to furnish an ample supply of pure *American wines* as the most sovereign preventive of intemperance. Laid on the table.

Mr. King of Massachusetts offered the following resolution:—

Resolved, That the models of fruit prepared by Mr. Townsend Glover, of Fishkill, New York, excel all others of the kind that have come under our notice;—that they are calculated to serve a very important purpose, in presenting perfect specimens for examination at all seasons and from all sections of the country; and that we respectfully recommend to the Congress of the United States, to employ Mr. Glover to prepare (under the direction of a committee to be appointed by this Society) a full collection of the fruits of the country, to be deposited in the Agricultural Department of the Patent Office at Washington.

After remarks from several gentlemen, the resolution was unanimously adopted.

Pears, suited for cultivation on quince stocks, were next considered.

Mr. Barry of New York, remarked that he had seen it stated in several newspaper paragraphs, that the cultivation of the pear on quince stocks had proved to be a failure. He regretted to have such statements sent abroad. They are not correct. He considered it a great blessing to the country, that pears could be cultivated on quince stocks, because it enabled thousands upon thousands of our citizens to enjoy delicious varieties of fruit years earlier than they otherwise could. Perhaps the best way to check this erroneous impression would be for the Society to recommend a list of pears that succeed best on quince stocks. He had prepared a brief list of sorts and would submit it for the consideration of the meeting. All the pears here enumerated were not, indeed, of the best quality, but they have been successfully proved on the quince. Before giving the list he would say that the best quince stocks were the Fontenay and another variety. The common apple or orange quince of this country is not a suitable stock for budding. It may grow well for one or two years, but will ultimately fail.

Pears for cultivation on quince stocks:—Rostiezer, Beurre d'Anjou, Beurre Diel, Duchesse d'Angouleme, White Doyenne, Louise Bonne de Jersey, Figue d'Alencon, Urbaniste, Easter Beurre, Glout Morceau, Pound, Cattilac, Vicar of Winkfield, Napoleon, Beurre d'Amanlis, Beurre d'Aremberg, Soldat Labourer, Beurre Langelier, Long Green of Cox, Nouveau Poiteau, and St. Michael Archange. The list was adopted by the society.

Cherries were next considered. Governor Wood, Black Hawk, Kirtland's Mary, Rockport Biggareau, Ohio Beauty and the Hovey were placed on the list of varieties which promise well.

Mr. Cabot of Massachusetts introduced for the consideration of the Convention the seedling cherry of Capt. George Walsh of Charlestown. There were, he said, claimed by Mr. Walsh, three varieties, ripening at intervals of one week from each other, but they were so much alike he (Mr. Cabot) could see no difference in them. He proposed to the Society to call it Walsh's Seedling.

Mr. Walker had been acquainted with this cherry 14 or 15 years. When it was first exhibited to the Horticultural Society,

there was some doubt as to its being a seedling, from the fact that a Mr. Brown of Beverly had exhibited a cherry very similar to it in appearance, which he called the Black Biggareau of Savoy. The Society, however, took so much interest in the question that a committee was sent out to Mr. Walsh's garden, to examine the trees and see if they were budded. He, Mr. Walker, was on that committee, and they came to the conclusion that the trees were not budded. The fruit is large, black,—equal in size to the Black Tartarian—firm flesh, excellent flavor, and quality A No. 1.

Quite a discussion ensued, during which it was contended by Mr. Prince that the cherry in question was not a seedling, and by Mr. Hovey that its true name is the New Black Biggareau.

The society adopted the name of "Walsh's Seedling," and placed it in the list of sorts which promise well. The Great Biggareau of Downing was placed in the list which promise well, and Sparhawk's Honey was passed by.

Strawberries were next taken up. Burr's New Pine was placed in the list recommended for certain locations, Walker's seedling in the list which promise well, Imperial Scarlet and Scarlet Magnet were passed, Jenny's seedling was recommended for certain locations.

Plums were next in order. The McLaughlin and Reine Claude de Bavay were put in the list for general cultivation.

Italian Prune or Fellenberg, a tree of remarkable vigor, very productive, and holding its fruit in spite of the curculio, was passed for the present.

Ives' Washington Seedling was placed in the list which promise well.

Raspberries. Mr. Cabot moved to strike the Red Antwerp variety from the list. He believed it to be a good variety, but there were so many other sorts better, it was not worth while to retain it.

Mr. Lines of Connecticut thought the Red Antwerp fully equal to the Franconia. Mr. Prince regarded it as one of the most splendid fruits ever placed on any table. Mr. Saul said it was the great raspberry of New York, and he was astonished to hear the gentleman from Massachusetts say anything against it. Mr. Cabot said as there might be some mistake about the true name, he would withdraw his motion.

Knevett's Giant was taken from the list which promise well, and recommended for general cultivation as a hardy, delicious variety, a good bearer, and far ahead of all others.

Dr. Brinckle's seedlings, the Orange, French, and Walker varieties, were placed on the list which promise well.

The President stated that the Orange was the most beautiful sort he ever tasted.

Lawton's Rochelle Blackberry was highly recommended; the fruit is very large. Not so much acidity as in other sorts, delicious flavor, sweet and pleasant.

Mr. Prince considered it a remarkable acquisition.

When the subject of Nectarines was introduced, Mr. Hooker of New York said it had been doubted whether Nectarines could be produced from peach stones. He would say that he planted stones of the Early York variety, and the produce from them were more than half Nectarines. He had picked the Early York peach as free from bloom as the Nectarine itself.

Grapes. The Diana was placed on the list for general cultivation.

The following resolution, which was offered by W. S. King of Massachusetts, was passed unanimously:—

Resolved, That we cordially invite our sister association—The North Western Fruit Growers Association—to meet the United States Pomological Society in council at the next biennial meeting, appointed to be held at Rochester, New York.

The business of the convention having been finished, Hon. Mr. Benson, member of Congress of Maine, addressed the Chair. He said he desired to offer two resolutions expressive of the thanks of the convention for the kindness and hospitality manifested towards the members by the Massachusetts Horticultural Society, and also their thanks to the President for the urbanity, dignity, and impartiality which had distinguished him in presiding over the deliberations of the society. The first resolution was in these words:—

Resolved, That the thanks of the society are hereby tendered to the Massachusetts Horticultural Society for the excellent arrangements made to receive and accommodate the members of this society, and for the kind invitation to their beautiful annual exhibition of fruits, flowers and other products of the earth.

Mr. Barry of New York said he was unwilling to have the vote taken without saying a few words on the resolution. The Massachusetts Horticultural Society was entitled to the cordial thanks of the convention for their bountiful hospitality and for the excellent exhibition to which they had been invited. He had seen many Horticultural exhibitions both in this country and in Europe, but in tastefulness of arrangement, in interest and instruction, this surpassed all he had ever seen. The display of fruits on the tables was hardly ever equalled in the world. He must say the Horticultural Society was entitled to the thanks of the delegates, not only as citizens, but as pomologists for what they are doing for Pomology. The enterprise of the members of the Massachusetts Horticultural Society is not equalled in the world.

The resolution passed unanimously, every delegate rising in his seat.

Resolved, That the thanks of the society are most cordially presented to the President, Hon. Marshal P. Wilder, for the prompt, able, and impartial manner in which he has presided over its deliberations; and we hereby assure him that the members will long cherish a lively recollection of the pleasure enjoyed at his bountiful and brilliant festive entertainment with which he complimented the society.

Mr. Lines of Connecticut was unwilling that this resolution should pass with a silent vote. It was due to the gentleman who has presided over the discussions of the society with so much dignity and ability. He considered that the position in pomology which the President had reached, conferred more honor upon him than the Presidency of the United States could do. A gentleman who confers such immense benefits upon the whole country,—he might say the world,—as Hon. Mr. Wilder does, is entitled to distinguished honors. He hoped this resolution, too, would be passed by a standing vote.

The resolution was unanimously adopted.

President Wilder made the following happy response to the last resolution:—

Gentlemen,—The resolution which you have just adopted awakens in me feelings of gratitude and affection. The interest which I have ever felt in the prosperity of this Association has induced me to accept of your suffrages and to occupy the chair for another term.

I beg to tender you my grateful acknowledgments for your co-operation and support, and to assure you of my unabated interest in the objects of the Society and in your personal welfare. May you go on, prospering and to prosper, and when we have done cultivating the fruits of earth, may we have the unspeakable felicity to meet in celestial fields, and gather ambrosial fruits from the Tree of Life.

There being no more business before the convention it adjourned at a quarter past two o'clock, to meet in Rochester, N. Y., in September 1856.

Report on Shade Trees,

Read before the Cincinnati Horticultural Society.

The Committee on Shade Trees beg leave to report that they have, for several years past, bestowed much attention to the subject of Shade Trees in general, and made many observations, at different seasons of the year, especially during the past summer of unprecedented drouth and heat, in cities as well as in the country, for ornament and for shade.

The task of making a selection of trees adapted to all the purposes of ornamental planting, of pleasure grounds, of lawns, and in the streets of cities, would require a more extensive knowledge of the arboretum than your committee would pretend to claim. For pleasure grounds, especially if extensive, scarcely any trees selected from our native forests will come amiss, if planted in groups, or promiscuously arranged, always having regard to circumstances, as locality, shape of the surface, aspect, character of the soil, etc., avoiding, as much possible, straight rows, which are unsightly, and, we think, should scarcely ever be allowed, except along the streets of cities

and villages, and on each side of roads and public highways in the country.

We can conceive nothing that would contribute more to beautify the scenery, and yield comfort and pleasure to the traveler, than the grateful shade of continuous rows of graceful Elms, of Silver Maples, of Sugar Maples, of Tulip trees, or even the common Locust, when planted in extended lines along the road sides. In addition to these, we would recommend the planting of our native Oaks, of every species, where the land is suitable, either for shade or ornament. No trees are hardier, or present a more beautiful or classic foliage.

In selecting a list of trees suited to planting along the streets of cities in this climate, we would confine ourselves to the consideration of those only that have been planted and fairly tested in and about the city of Cincinnati, within the last twenty years, for the purpose of affording ornament and shelter from the intense heat of an almost tropical summer's sun.

It is evident, therefore, that our range of choice must be quite limited, as out of the great number that have been tried in this city, a few only can withstand the vicissitudes to which they are necsarily exposed. The roots compressed and contorted beneath brick and stone pavements and walls, and the branches and foliage smothered with dust, and smoke and pestiferous gases.

This small number, therefore to sustain such extraordinary exposures, must possess a character of great hardihood.

The above considerations should always direct the citizen in selecting shade trees to plant along the streets. He will find it necessary, in many instances, to forego the enjoyment of odoriferous flowers, to secure a dense green and compact foliage, that will protect him from the scorching rays of the sun. A foliage that is also obnoxious to the depredations of insect tribes.

The first tree that we would unhesitatingly recommend, after watching it carefully during the past season of unmitigated heat and drouth, both in the city and country, is the Chinese Alianthus, or Tree of Heaven, with its smooth, erect stem, strong and sturdy branches, with a deep green and graceful foliage of unsurpassed beauty. No other tree can be found in this country that communicates to a street in the city such an air of oriental magnificence, as two long extended rows of this beautiful exotic.

But to convey to the beholder a pure sense of its grandeur and beauty, the rows should be continuous, and not alternated or interrupted by any other trees. Long avenues of one kind produce the most pleasing effect; but different streets may, with much good taste, be planted with entirely different sorts.

The objections to the Alianthus that have been urged by a few persons of sensitive nerves—the peculiar odor of the flowers—we consider altogether futile, as familiarity and habit will soon render it not only innocent, but an agreeable perfume; and the whole tree, so far from being poisonous, has been found to be a wholesome tonic and stomachic like the Prickly Ash.

Next to this comes the Silver Poplar, or Abele tree. This, although presenting an entirely different appearance, is another form of beauty; is very hardy, and affords a good shade, particularly the newer varieties.

The Catalpa, which has been long tried, is also another good clean tree, free from insects, with large, smooth, silky leaves, and most beautiful, showy flowers, is quite hardy, and affords a most agreeable shade to the sidewalk.

The European Linden, so far as tried in the city, seems to flourish well, and forms a dense pyramidal head, and the perfume of its flowers is delightful.

The Paper Mulberry was one of our best trees for the street, it is of quick growth, entirely free from insects, forms a dense spreading shade, and although nearly destroyed by the unexampled winter of 1851, deserves again to be planted.

The Silver Maple is another beautiful tree, but does not flourish amid the dust and smoke of a crowded city. In an open, airy street it will thrive very well, but can not be recommended for general planting in the city.

The Horse Chestnut is another good

tree for the street, in Eastern cities, and deserves a trial here. It forms a broad, spreading top, and has handsome flowers.

The weeping willow is another tree that grows with much vigor in Cincinnati, and if planted in continuous rows along the more retired streets, and trained high, it would afford an object of exquisite beauty.

For planting lawns and door-yards in the country, we would not presume to make a selection, as all trees and shrubs are ornamental if planted with taste—that is, agreeably to the dictates of nature, and not in mathematical lines and diagrams.

S. MOSHER, Chm'n.

Importance of the Onion.

The onion is worthy of notice as an extensive article of consumption in this country. It is largely cultivated at home, and is imported, to the extent of seven or eight hundred tons a year, from Spain or Portugal. But it rises in importance when we consider that in these latter countries it forms one of the common and universal supports of life. It is interesting, therefore, to know that. in addition to the peculiar flavor which first recommends it, the onion is remarkably nutritious. According to my analysis, the dried onion root contain from twenty-five to thirty per cent. of gluten. It ranks, in this respect, with the nutritious pea and the grain of the East. It is not merely as a relish, therefore, that the wayfaring Spaniard eats his onion with his humble crust of bread, as he sits by the refreshing spring; it is because experience has long proved that, like the cheese of the English laborer, it helps to sustain his strength also, and adds, beyond what its bulk would suggest, to the amount of nourishment which his simple meal supplies.—*Chemistry of Common Life.*

Franklin's Opinion of Agriculture.

Dr. Benjamin Franklin, in 1787, expressed his sentiments upon this subject in a very remarkable manner. The convention to delibrate upon the formation of the constitution was held in Philadelphia in May, 1787. Dr. Franklin was then Governor of Pennsylvania, and also a member of ihe convention. As the delegates were assembling, he invited them to his house, and read to them a paper on this subject, which was subsequently printed; and to extracts from this I would call your attention.

"There are in every country certain important crises, when exertions or neglect must produce consequences of the utmost moment. The period at which the inhabitants of these States have now arrived, will be admitted by every attentive and serious mind to be of this description.

"Our money absorbed by a wanton consumption of imported luxuries, and a fluctuating paper medium substituted in its stead, foreign commerce entirely circumscribed, and a federal government not only ineffective, but disjointed, tell us, indeed too plainly, that further negligence may ruin us forever. Impressed with this view of our affairs, the writer of the following page has ventured to intrude upon the public. But as neither his time nor his opportunities will permit him to treat of all the great objects which excite his apprehensions or engage his wishes, he means principally to confine himself to that part of them which has been most subjected to his observations and inquiries.

"In a country blessed with a fertile soil, and a climate admitting steady labor, where the cheapness of land tempts the European from his home, and the manufacturer from his trade, we are led by a few moments' reflection to fix on agriculture as the great leading interest. From this we shall find most of our other advantages result, so far as they arise from the nature of our affairs, and where they are not produced by the coercion of laws—the fisheries are the principal exceptions. In order to make a true estimate of the magnitude of agriculture, we must remember that it is encouraged by few or no duties on the importation of rival produce—that it furnishes outward cargoes, not only for our own ships, but those also which foreign nations send to our ports; or, in other words, that it pays for all importations—that it supplies a part of the clothing of our people, and the food of them and their cattle—that what is consumed at home, and including the materials for manufacturing, is four or five times the value of what is exported—that the number of people employed in agriculture is at least nine parts in ten of the inhabitants of America—that therefore the planters and farmers do form the body of the militia, the bulwark of the nation—that the value of property, occupied by agriculture, is manifold greater than that of the property employed in every other way—that the settlement of our waste lands, and subdividing our improved farms, is every year increasing the pre-eminence of the agricultural interests—that the resources we derive from it, are at all times certain and indispensably necessary—and lastly, that the rural life promotes health

and morality by its active nature and by keeping our people from the luxuries and vices of the towns. In short, agriculture appears to be the spring of our commerce, and the parent of our manufactures."

☞ Downing's Cement, made by dissolving Gum Shellac in Alcohol, has never been surpassed as a shield for covering the wounds made by pruning trees.

Historical Fruit Notes.

Apples have been believed by some to have been introduced into Italy from Media, and that the Falisci, or inhabitants of Montefiascone, were the first to plant them in rows. But this must apply to some particular variety, not to the species, which we have already stated to be indigenous, but very early cultivated. Pliny enumerates twenty-three varieties, which appear still more difficult to identify with ours than the pears. Among the few that modern authors have recognised, the *Appiani* of the Romans are supposed to be the *Appie* or *Appiole* of the modern Italians, the *Appia pyriformis* to be the Appiolona lunga, the *Syriaca ruberrima* to be red Calvelle, &c. In more modern Tuscany, Micheli, in his above mentioned manuscript, describes fifty-six sorts under the Medici princes, fifty-two of which are figured by Castello.

The *Quince* (Pyrus cydonia,) also a European plant and indigenous in Italy, has given rise to much fewer varieties, although equally in cultivation since the days of the Ancient Greeks and Romans. Pliny enumerates five only, including, probably, the three principal ones of more modern days, described by Matthioli in the sixteenth century, viz.: 1, the common large apple-shaped quince, *melo cotogna* of the Italians, the best and highest flavored variety, which is the *mala aurea*, and the *mala cana lanugine* of Virgil, and *mala colonea* of Pliny, said by him to have been introduced from Crete in the days of Galen; 2, the pear-shaped quince or *pera colonea*, called by Dioscorides, Galen, and Pliny *Struthium*, which attains a larger size than any of the others; and 3, the *Milviana* of Pliny, called in Matthioli's days *bastard quince*, probably our wild indigenous variety. The two former, especially the first, may have been originally raised in Palestine, where quinces are common, and were appreciated for their odour in very ancient days, as appears by their mention in the Bible. The golden apples of the garden of the Hesperides have by some been supposed to be quinces, whilst others have with more plausibility referred them to the orange. On the other hand, the nuptial apple prescribed by Solon was evidently the quince and not the lemon. Quinces are at the present day much prized by the peasantry, in some parts of the south of Europe, for perfuming their stores of linen, independent of their consumption for culinary and confectionary purposes.

The *Medlar* (Mespilus germanica) is common in the woods of Italy and Sicily, and the assertion of Pliny that it did not exist in Italy at the time of Cato must be erroneous. Theophrastus calls it *setaneios*, as does Dioscorides, who also gives it the names of *mespilon* and *epimelida*, and says that it is a native of Italy. It extends over a great part of Europe, and is cultivated in Italy, though more sparingly and less appreciated than in Germany and England. Besides the common one, the Italians have a larger variety, and a small one without stones.

We fully concur with Prof. Targioni in his conviction that the wild *Cherry* (Prunus cerasus,) common in the woods of Italy and other parts of Europe and Asia, is the mother plant of all the kinds of that fruit now in cultivation, in opposition to many modern botanists, who follow De Candolle in distinguishing four species, Cerasus avium, C. duracina, C. Juliana, and C. caproniana, or even go far beyond him in their multiplication. The species is also evidently indigenous, notwithstanding Pliny's statement that there were no cherries in Italy, before the victory obtained over Mithridates by Lucullus, who was the first to bring cherries to Rome in the year of Rome 680, and that within one hundred and twenty years after that, they were spread over the Empire as far as Britain. This statement gave rise to the tale that cherries came originally from Cerasunte, now Zefano, and were therefore called *cerasus* by the Latins. Lucullus may, however, have first imported the cultivated varieties, which the Romans may not have recognised as identical with the wild cherry. In Greece, cherries were certainly known long before this time, for Diphilus Siphinus, according to Athenæus, mentions them under the government of Lysimachus, one of the dukes of Alexander the Great.

Among the numerous varieties of cherries of modern days, Pliny records only eight, of which the *Juliana*, according to Matthioli and Micheli, is the *acquaiola* of modern Italy, and the *ceciliana* according to Micheli and Gallesio, is the *viscialona*, believed to have been brought from Arabia to Spain, and thence to Rome. The varieties known in modern Tuscany are chiefly due

to the exertions of the Grand Dukes of the Medici family. Micheli, in the catalogue already quoted, enumerates forty-seven sorts, and Castello has figured ninety-three. The double-flowering variety was first introduced into the gardens of Florence by Giuseppe Benincasa Fiammingo, curator, under Francis I. of Medicis, of the botanic garden then called *delle Stalle*, afterwards *dei Semplici*.

The cherry-tree, especially of the *Bigarreau* variety, grows to a very large size; one is recorded on the shores of the Gulf of Nicomedia, of which the circumference of the trunk was four-and-a-half braccie, (about nine feet), and Prof. Targioni himself had one cut down on his own *podere*, which was beginning to decay, and had a trunk of eight feet in circumference.

The *Plum* (Prunus domestica) is said by Prof. Targioni, after the generality of systematic botanists, to be indigenous to the woods of Italy, and an expression is quoted of Pliny's to the same effect, "sed pruna sylvestria ubique nasci certum est." But these *pruna sylvestria* must have been the *Sloe* (Prunus spinosa). Our garden plums appear, from the investigations of our Indian botanists, to be varieties produced by long cultivation of the *Prunus insititia*, a species common in the mountains of Asia, from the Caucasus to the Eastern Himalaya, but which we have no authentic evidence of being a native of Europe. In all the more accurate European floras, the P. domestica insititia are either omitted, or inserted as doubtful natives or escaped from cultivation; or if, in some instances, positive native stations are given for the P. insititia, it is generally some variety of the P. spinosa that has been mistaken for it.

Several varieties of the garden plum were introduced by the ancient Romans from the East, as we are informed by Pliny, since the days of Cato, who was born two hundred and thirty-two years before the Christian era. Such was, for instance, the *damson* or *damascene plum*, corrupted into *moscine* by the Italians, which came from Damascus in Syria, and was very early cultivated by the Romans. This was probably the early or summer damson, not known in Tuscany in the time of Micheli; but another similar variety, much cultivated in Liguaria, the autumn or winter damson was brought there from the East by the Genoese returning from the Crusades. Muratori says that the Italian name for the plum, *Susine*, was derived from Susa in Persia, whence it had been introduced into Italy. But the most ancient Latin name was *prunus*, and with the Greeks *coccymela*.

Pliny enumerates eleven varieties of plums, amongst which the *cerina*, mentioned also by Virgil and Ovid, is, according to Fee, the Mirabelle; the *purpurea* is said to be the myrobolan, which, however, cannot be the case, if the latter be, as is supposed, of American origin; and the *damascena* is the summer damson. In Tuscany, a considerable number are enumerated as very common, by Matthioli, in the sixteenth century. At a latter period, Father Agostino del Riccio mentions several as new since he was young, and amongst them the myrobolans, said to be natives of North America. Canon Lorenzo Panciatichi gives the name of eighteen sorts, as common in the seventeenth century; and Micheli has fifty-two in the above-quoted manuscript list of fruits for the Grand Ducal table, and seventy-three in another of rare plants cultivated in Tuscany.

The *Almond* (Amygdalus communis) is said to be really indigenous in several of the floras of the Southern and Eastern Mediterranean regions, including Southern Italy and Sicily, but it is extensively cultivated and grows so readily over the whole of south Europe, that it may, in many instances, have spread from cultivation. It is, however, well known to the ancients, and is supposed to be the *Sciakedin* of Scripture, sent as a present to Joseph in Egypt, from the land of Canaan. Dioscorides and Galenus speak of its medicinal properties under the name of *Thassia picra*, and *amygdaleas*. Pliny doubts whether almonds were known in Cato's time, because he considers that the last-named writer meant walnuts when speaking of *Greek nuts*, but the majority of commentators agree in referring that name to almonds. In modern days the varieties grown in Southern Europe have become very numerous. Micheli describes ninety-four, but his distinctions are very refined, and ta en often from accidental forms; the specimens from which he described them are still preserved in Prof. Targioni's collections.

Pliny, as well as Linnæus and most modern botanists, includes amougst plums the *Apricot* (Prunus armenaica,) a tree most extensively cultivated, and which sows isself very readily in cultivated grounds over South-eastern Europe, Western Asia, and East India, but its native country is very uncertain. Targioni says, on the authority of Reyner, an Egyptian traveler, that it is of African origin, but does not give the precise locality, and we have neither seen nor heard of any really wild specimens. The ancients called it *Armeniaca*, as having been brought from Armenia into Italy, where it is not indigenous; also *præcoca*, *præcoqua*, and *præcocca*; and under one or other of these names it is mentioned by Dioscorides, by Galen, by

Columella (who is the first who speaks of its cultivation), by Pliny (who, about ten years after Columella, asserts that it had been introduced into Rome thirty years), by Martial, &c. Democritus and Diophanes give it the name of *bericocca*, analogous to the Arabian *berkac* and *berikhach*, the probable origin of the Italian names of *bacocca*, *albicocca*, and even, according to Cesalpine, *barracocca;* and, lastly, Paolo Engineta, according to Matthioli, has spoken of these fruits under the name of *doracia*. Although some of these names, even in modern times, have been occasionally misapplied to a variety of peach, yet they all properly designate the apricot, and show that that fruit was known in very remote times. Having never been much appreciated, except for its odor, there was not in former days any great propagation of varieties of it. Micheli, however, under the Medicis, enumerates thirteen among the fruits cultivated for the private table of Cosmo III.

The *Peach* (Amygdalus persica) is, according to the common opinion, of Persian origin. Diodorus Siculus says that it was carried from Persia into Egypt during the time that Cambyses ruled over that country. It is supposed to have been transported from thence into Greece, and, after a lapse of time, into Italy, where it only began to be known about twenty years before the birth of Pliny, that is, about seven years before the Christian era, and it appears that Columella was the first to treat of its cultivation there. According to Nicander, it was brought to Greece by the agency of Perseus from Cephia, a locality affirmed by some to have been in Persia, by others in Æthiopia, or in Chaldea. The peach is also spoken of by Theophrastus, Dioscorides, and other Greek writers. We must therefore conclude that this fruit was well known in the East very long before its introduction into Italy. Many ancient writers, including Athenæus and Pliny, and some more recent ones, as, for instance, Marcellus Virgilius, in his Commentaries on Dioscorides, confound the peach with the *persea*, a fruit the identity of which is uncertain, some supposing it to be a Cordia, others a Balanites. Marcobius again confounds the *persicum* of Suevius, which is the walnut, and with that of Cloatius, which is the citron; all fruits resembling the peach in nothing but in the name, a clear proof that it cannot have been in their days by any means a common fruit. How few were the varieties of peach known to the ancients appears from Dioscorides who only names two, from Pliny who enumerates five, and Palladius four only, giving at the same time accurate information on the mode of cultivating them.

With regard to the introduction of the peach into Tuscany, it appears that several varieties were known already in the days of the Republic, but that the greater number were, as in the case of other fruits, due to the exertions of the Medici sovereigns. Matthioli, in the sixteenth century, enumerates a considerable number as then in the possesion of Tuscan cultivators; Micheli, under Cosmo III., has forty-three, and in the drawings of Castello are represented about thirty. That called *Poppe di Venere* (the *Late Admirable* of our Horticultural Catalogue) is supposed to be one of the most ancient in Italy, and is mentioned by Agostino del Riccio and Micheli, under the name of *Pesche Lucchesi*.

Although all the evidence collected by Prof. Targioni tends to shew that the peach was originally brought from Persia, and he, therefore, does not consider it necessary to proceed further with the investigation, yet no traveller whom we can rely upon has ever found it growing really wild there or anywhere else. We are, therefore, left in doubt whether its native stations remain yet to be discovered, or whether its original wild type must be sought for in some species of Amygdalus known to be indigenous in the East. It has been more than once suggested that this original parent is no other than the common almond, a conjecture founded perhaps on the similarity in the leaves, and in the perforations of the edocarp, but rejected as absurd by those who attach even generic importance to the succulence of the indehiscent pericarp. This point cannot be decided with any degree of plausibility, until we have a better knowledge of the different forms which the fruits of wild Amygdali may assume under various circumstances; but we may mention, as circumstances in some degree favoring the supposition that some kind of almond is the parent of the peach, the ancient tradition referred to by Targioni (with the remark that it is contradicted by Pliny, and common sense) that the peach in Persia was poisonous, and became innocuous when transported to Egypt, and the case quoted of a supposed hybrid raised in 1831 in Sig. Giuseppe Bartolucci's garden, at Colle di Val d'Else, from a peach-stone, which produced fruits at first exactly like almonds, but which, as they ripened, assumed the appearance and succulence of peaches, whilst the kernel remained sweet and oily, like those of almonds. We might also refer to some bad varieties of peach with very little juice to their pericarps, although we do not know of any which assume the flattened form of our almond, a distinctive character which appears to us to be of considerable importance. The foliage and

flowers of the two trees show little or no specific difference.

The *Jujube* (Zizyphus vulgaris), a common tree in the Levant, is also now found wild in various parts of South Italy and Sicily, but Italian botanists are much divided in opinion as to whether it is really indigenous, or becomes naturalised only after cultivation. Prof. Targioni, after Bertoloni, adopts the former opinion, and considers that the erroneous belief in its exotic origin arises from a mistaken assertion of Pliny's that jujubes did not exist in Italy prior to their importation from Syria by the Consul Sextus Papinius towards the end of the age of Augustus. Among the ancients, Hippocrates considered the fruits as medicinal; Galen deprecated them both as medicine and as food. Modern cultivation has produced a few varieties, and there is a considerable consumption of them in some parts of the south of Europe, either as an inferior raw fruit, or for the manufacture of the pectoral lozenges known as *pate de jujube;* but they are little appreciated in modern Italy, and were still less so in earlier times.

We learn from Pliny and Galen that the *Pistachio-nut* (Pistacia vera) is a native of Syria, and from the former writer, that it was first introduced into Italy towards the end of the reign of Tiberius (who died A.D. 37) by Lucius Vitellius, afterwards Emperor. and that at about the same time, it was carried into Spain by Flavius Pompeius, a Roman knight, companion in arms to Vitellius. Well known to the ancients, it is supposed by some to be the *batnim* of Scripture, and generally believed to be the *Indian terebinth* indicated by Theophrastus as a native of Bactria. It is mentioned by Nicander and Dioscorides under the name of *pistacia, bistacia,* and *phistacia.* In Sicily it is of very ancient cultivation, and there called *fustucha* or *fastuca.* It is now extensively planted in some parts of the Southern and Eastern Mediterranean regions, and might be so in Tuscany, where a few trees, scattered here and there, ripen their fruits well.

Notwithstanding the above-quoted indications of the eastern origin of the pistachio, it remains to be ascertained where it is truly indigenous, and what is its real wild typical form. Botanists give as its native habitat Syria, Persia, East India, Arabia, and Barbary, but in most of those countries it is certainly only known in a cultivated state. We have seen no wild specimens in our largest herbaria, and find no reliable indications of any native stations in local floras. Targioni mentions a variety *narbonensis* as having become wild in great abundance in the neighborhood of Montpellier, but during several years herborisations in that country we never saw any species at all allied to it, except the common small fruited Pistacia terebinthus. The authority of Gasparrini is also quoted for a hybrid between P. vera and P. terebinthus, which according to Sestini and Boccane, has multiplied itself in various parts of Sicily. If that be the case, it would lead to a strong presumption that notwithstanding the great difference in the size and shape of the fruit, the P. vera and the P. terebinthus, and consequently also the P. mutica of the Crimea and Asia Minor, are mere varieties of one botanical species common in the Mediterranean region from Spain to the Black Sea and Asia Minor.

The *Walnut* (Juglans regia) is a native of the mountains of Asia, from the Caucasus almost to China. It is supposed to be the *Enoz* of the Bible. The Greeks had it from Asia; and Nicander, Theophrastus, and others mention it under the names of *carya, carya persica,* and *carya basilike* (or royal nut). Pliny informs us that it was introduced into Italy from Persia, which must have been of early date, for, although it be doubtful whether it is alluded to by Cato, it certainly is mentioned by Varro, who was born in the year 116 B.C. The Romans called it *nux persica, nux regia, nux Eubœa, Jovis glans, Djinglans, Juglans, &c.* They recognised several varieties, and amongst them the soft-shelled walnut still cultivated, which several commentators have confounded with the peach. In modern days the cultivation has much extended, and the number of varieties considerably increased. Jean Bauhin noticed six only. Micheli, under Cosmo III. of Medicis, describes thirty-seven, of which the original specimens are still preserved; some of these, however, are scarcely sufficiently distinct from each other.

The *Nut* (Corylus avellana) is said by Pliny to derive the name of *Avellana* from Abelline in Asia, supposed to be the valley of Damascus, its native country. He adds that it had been brought into Asia and Greece from the Pontus, whence it was also called *nux pontica.* Theophrastus calls these nuts by the name of *Heracleotic nuts,* a name derived from Heraclea, now Ponderachi, on the Asiatic shores of the Black Sea. Hippocrates gives them the name of *carya thusia.* Dioscorides says they were also known by the name of *leptocarya,* or small nuts. Other ancient writers confound the nut with the chesnut and the walnut. But all the above indications of importation from the East, relate only to particular varieties, for the species, as is well known, is common enough in Italy as

in the rest of Europe and a great part of Asia in a really wild indigenous state.

The *Chestnut* (Castanea vesca), celebrated amongst European trees for the enormous size it will attain, is already mentioned in the Bible. Theophrastus and Athenæus give it the name of the Eubœan nut, from the island of Eubœa now Negroponte, where it was peculiarly abundant. Pliny says that chestnuts first came from Sardi, the ancient capital of Lydia, and not far from the modern Smyrna. Galen, who was a Lydian, confirms that origin, and says that they were also called *balana leuceni*, from Leucene, situated on Mount Ida. Other writers, ancient and modern, give various Eastern countries as the native stations of the chestnut, and even Giovanni Targioni-Tozzetti, our author's grandfather, believed them to be introduced only into Italy; but not only have the extensive chestnut woods in the Apuan Alps and other parts of the Apennines, mentioned by Bertoloni, every appearance of being really indigenous, but further evidence that woods of this tree existed in Tuscany from very remote times, may be found in the number of places, which have derived their names from them. such as Castagna, Castagnaia, Castagneta, &c. We may, indeed, safely give as the native country of the wild chestnut, the south of Europe from Spain to the Caucasus. It does not extend to East India.

The larger fruited varieties which we import for eating, and which are generally distinguished in France and Italy under the name of *marrons* or *marrone*, were probably those which were first introduced from the East by the Romans. Pliny enumerates eight different varieties. Micheli has forty-nine, most of which, however, from his own specimens are, as in the case of the other fruits mentioned in his manuscript, founded upon distinctions too slight to be really available for their separation.

The *Fig* (Ficus carica) is a native of the south of Europe, including Greece and Italy, of Northern Africa, and of Western Asia. The wild type known in Italy by the name of *Caprifico*, has indeed been distinguished by Gasparrini, not only as a species but as a separate genus, but we cannot but concur with Prof. Targioni in the opinion, confirmed by positive assertion on the part of practical pomologists, both ancient and modern, that our garden figs are of the same species, and have repeatedly been raised from seeds of the wild caprifico.

We find mention of the cultivation of figs, and of the high estimation in which these fruits were held, in the very earliest writings, in the Holy Scriptures, as in Homer's Iliad. Those of Athens were celebrated for their excellent flavor. Xerxes was tempted by them to undertake the conquest of Attica, in the same way that Cato urged the Romans to that of Carthage, a fig in his hand. The number of varieties, however, produced in ancient Italy were not numerous. Six only were known in the time of Cato. Others were afterwards introduced from Negroponte and Scio, according to Pliny, who gives a catalogue of thirty sorts. Their names are mostly taken from the countries whence they had been brought, such as the African, the Rhodiote, the Alexandrine, the Saguntine, &c., or from some great personage who had introduced or patronised them, such as the Pompeian from the great Pompey, the Livian from Livia the wife of Augustus, &c. Macrobius, two centuries after Pliny, enumerates twenty-five, but generally under different names from those of Pliny. Gallesio, in his Pomona Italiana, has referred a few of those ancient names to modern Italian varieties, as for instance:—

The *Albicerata* to the white fig of the Italians.

The *Tiburtina*, to the gentile.

The *Africana* to the brogiotto nero, which some believe to be also the *Emonio* of Athenæus.

The *Liviana* to the pissalutto.

The *Lydia* to the *fico trojano*, very abundant at Naples.

The *Carica* to the *dottato*, common in the Levant, and originally from Canni in Caria, from whence so many were sent to Greece, and called on that account *cauni figs* and *Carica*.

Dr. Antonio Targioni.

The Grape Vine in Warm Countries.

The opinion has been entertained by intelligent persons, possessed too of a good deal of practical knowledge in regard to the culture of the vine, that the coast country between Mobile and Lake Ponchartrain is too sandy for the perfect development of the grape, and too hot to admit of making good wine. We believe both positions to be wrong. It may be that many of the foreign varieties of the vine, even in the most careful hands, would not succeed. But we are satisfied that some of the kinds which have been introduced among us, would, if properly treated, produce the finest fruit, and there are unquestionably a number of indigenous grapes in the southern part of the State that might be vastly improved by proper culture, in our immediate vicinity, J. C. Hodges and Robert Harwell have produced in full perfection, the white and black Hamburg, Catawba,

&c., and at Pascagoula, Col. Jacob Baptiste has for many years obtained very fine fruit from the Black Spanish and some other kinds. He has also tested their fitness for wine, and is sanguine of being able to make excellent red wines from the former. James McGoffin, Esq., of St. Stephens, has devoted a great deal of attention to the grape and wine making, and from year to year, for a long time, has fabricated wines from the wild grape of excellent quality; and in different parts of the State a number of specimens have been exhibited, made from the scuppernong grape.

These limited experiments are sufficient to prove that the heat of our climate and the poverty of the soil are the obstacles in the way of making good and wholesome wines. But if not satisfactory, we can cite examples in Brazil and Peru, both tropical countries, and much warmer in some localities than in this section. In the former, the grape vine yields abundantly in and about San Paulo (about 24° south latitude) and a very superior wine is made from them. The culture was commenced by the early Portuguese, and delicious fruit and wine have been annually produced up to the present day. In Peru, between 12° and 15°, where the soil—especially on and contiguous to the coast—is, if possible, more sandy and sterile than in this region, ad the temperature much higher, the grape thrives well and superior wines and brandies fabricated from it.

At Yca, remarks Dr. Von Tschudi, in his travels in Peru, "scarcely anything but the vine is cultivated in the haciendas of the environs; and this branch of husbandry contributes greatly to enrich the province. It is astonishing to see with what facility the vine thrives in a soil apparently so unfruitful. The young shoots are stuck into the sand almost half a foot deep, then tied up and left to themselves. Whilst the surrounding country bears the appearance of a desert, the vineyards of Yca are clothed in delightful verdure. The greater part are used for making brandy, which is extremely good and well flavored. All Peru and a great part of Chili are supplied with this liquor from the vale of Yca. A kind of brandy, of superior quality, and much dearer, made from Muscatel grapes, is called *Aguardiente de Italia*. It is distinguishedby a very exquisite flavor. Very little wine is made in Yca. In some plantations they make a thick, dark-brown kind, which is very sweet, much liked by the Peruvians, though not very agreeable to European palates. Only one planter, Don Domingo Elias, the richest and most speculative cultivator on the whole coast, makes wine in the European manner. It is very like the wines of Madeira and Teneriffe, only it is more fiery and contains a more considerable quantity of alcohol. Specimens which have been sent to Europe have obtained the unqualified approbation of Connoisseurs. The flavor is considerably improved by a long sea voyage."

The climate of Yca, according to the same authority, is very hot. South of it are some large cotton plantations. So, here is ample proof that a hot climate is not unfavorable to the grape culture and that the vine and the great southern staple may be grown side by side with profit.

Mr. Elias, referred to by Dr. Tschudi, is advantageously known in this country. He is a well educated and highly polished man, and has exerted himself more for the advancement of agriculture and other branches of industry than any other man in Peru, perhaps in the whole of South America. The writer of this had the pleasure of making his acquaintance in Havana, in 1841. He had been traveling through the Northern States, acquainting himself with our systems of manufactures, arts, agriculture, &c., with a view to introduce some of them into Peru. He took home with him tools, implements, seeds, fruit trees, &c., with the hope that some of his countrymen might be induced to abandon their rude mode of culture, and aid also in the establishment of manufactories, &c.—*Ala. Planter*.

Growing Grapes for Wine.

To the Editor of the California Farmer:

SIR: Will you please to inform me as to the best mode of growing grapes for the purpose of making wine? the climate, soil, manure, temperature, mode of training, and quality? whether hill or dale is best for cultivation? when is the best time to plant? and, in short, general particulars, with a view to inform many who are wishing to go into the business, which will, no doubt, hereafter become a great source of employment, both of capital and labor, in this country; but of which, at present, little is known. My place is within thirty miles of the city, in a fine climate, and consists of hills and valleys.

AN OLD SUBSCRIBER.

We are happy to respond to our correspondent as to the cultivation of the grape. It must soon attract greater interest, and will eventually become a prominent branch of the "home industry" of California, and a large source of revenue to our citizens and to the State.

In order that the best and quickest results may accrue to those who wish to engage in the cultivation of the grape, it is

all important that those who engage in such an enterprise should have an interest and a pleasure in the employment beyond the mere dollars. There should be a love of the employment sufficiently strong to watch every new development, and a desire to make a progress in so important an interprise.

The climate of California is peculiarly adapted to the growth of the vine, and there need be no fear of the climate, as almost every portion of our State will produce grapes abundantly.

The soil best adapted to the grape is a light, deep, sandy loam. This soil can be enriched by old and thoroughly decomposed manures, added to, and mixed with the entire soil. The grape delights in a dry temperature. If the soil is rich, deep, and well pulverized, the roots will penetrate and find moisture, while the foliage revels in the dry and sunny atmosphere above. We believe that it will be found that vines planted on our *hill sides* will produce grapes of a finer quality, and in greater abundance, than when planted in our valleys. We are satisfied that some of our finest soil—soil adapted particularly to the grape—abounds along our beautiful hill sides, and that more attention should be given to this subject than has been heretofore rendered.

The grape, when planted in our valleys, leaves the roots during the rainy season to a long exposure to cold and wet soil. This must always be very injurious, and will, in a great degree, check the quantity and quality of the fruit, while those planted in our warm soil, upon the slopes, will receive nourishment of the rains, and not receive injury by the cold or rainy season. All who are familiar with grape-growing in other countries, will remember that one of the cardinal efforts in the preparation of the grape border, is always to have a *warm and dry border for the roots to revel in.* It must be well drained, deep, rich and warm. Such can our hill sides be made; and we believe it will be found to be the place especially designed for the cultivation of the grape. We also believe that within a short time we shall see our lovely mountain slopes beautifully decorated with walks, terraces, and vineyards, like the "vine-clad hills of sunny France."

In California, the months of December and January will be found the best months for the planting of vines. After the "early rains," and the grounds are mellowed, the soil is in the best state for working, and the whole vine receives more strength than by any other mode of cultivation.

The vines may be grown to strong stakes, or upon trellis work. We prefer the former for large vineyards, and the latter for gardens. The system for pruning for this county, should be the short, or spar pruning.

There can be no doubt of great success to any and all who engage in the cultivation of the grape, and give their time and interest to it. It will be found not only interesting, but very profitable for the time to come, when *California Wine* will be celebrated over our own State, and a great and profitable article for export.—*California Farmer.*

Large Yield of Grapes.

Charles Carpenter, of Kelley's Island, one of the most successful cultivators of grapes in this country, from a single acre of his own growing, last season, expressed 800 gallons of juice, making 700 gallons of wine. Beside this, he sold $100 worth of grapes, and his family and some fifteen hands ate all they chose during the season. This single acre yielded at least $1200, and it was the poorest season they have ever had at the Island for grapes.

These wines sell readily for $1 50 a gallon. It is the best grape region throughout the United States. The Catawba is preferred, and nine-tenths of the vines are of this variety.

We hope to have some particulars soon from Mr. Kelley, or Mr. Carpenter, as their cultivation differ from that employed by the Cincinnatians.—*O. Farmer.*

Basswood Paper.

For the last year or two the publishers of newspapers throughout the country—especially the large metropolitan dailies—have been in a quandary to know where the materials were to come from out of which to manufacture the vast quantities of paper needed for their daily issues. Rags, abundant as they are in the world, had begun to prove insufficient—paper gradually became dearer—and any known substitute for rags could not be purchased at such a rate as would enable the paper manufacturers to furnish it cheaper. Throughout the West, also, there has been a very great scarcity of paper, and during the fall and winter many publishers of newspapers have been compelled to issue half sheets, and occasionally to intermit their publication altogether. In Europe, too, the scarcity was felt in some degree, and we could no longer obtain from foreign countries as large a quantity of rags as formerly. What was to be done?

Evidently some new material for paper must be found, or newspapers must increase their prices, which, in these days of universal reading and brisk competition, would not be relished by either readers or pub-

lishers. Rewards were offered in various quarters to any one who would supply the desideratum. This was the thing to stimulate Yankee ingenuity, and we had faith to believe that in the teeming brains of some one of the race lay any quantity of the raw material for paper. We were not disappointed. In due time the announcement came that innumerable cords of basswood, rotting on thousands of acres all over the country, could be made into a very good kind of pulp for paper, at about a fourth or fifth the price of that made of rags; and the manufactured article, now lying before us, of a firm, strong body, and smooth sure face, capable of receiving a good impression, is an evidence of the triumph of the invention.

We understand that arangements are being made in Albany to manufacture pulp from basswood on a large scale, with a view of supplying paper-makers all over the country. The wood is first converted into shavings by passing through a plaining-mill of peculiar construction, and, after one or two other processes, the foreign matter is removed, and only the simple fiber for paper remains. It is now ascertained that paper of a good quality can also be made from several other kinds of wood, the finest and strongest sort of bank-note paper having been already manufactured from cedar, and, we believe, by the processes above referred to.

We are glad to learn that Mr. Henry Butler, one of our well-known citizens, and long familiar with all the details of the paper manufacture, is about taking steps to form a company here for the purpose of manufacturing paper from the new material. The old machinery will answer, with a very slight modification; so that nothing is required but to obtain the pulp from the Albany establishment, where alone it will be furnished, the inventor reserving for himself the right to prepare it for use. We need not enlarge upon the importance to the publishers of the West of the successful manufacture of a good kind of paper from this material, at as cheap a rate as is now promised. It will relieve them from the embarrassment which they have so long suffered from an insufficient supply of paper, diminish the expenses incurred in the publication of their journals, and enable them to afford a better and cheaper article to the public. We trust Mr. Butler will be successful in his laudable enterprise.

[Who more interested in the cheap and good production of paper than the Horticulturist? A plentiful supply of good paper is the first great requisite to the diffusion of knowledge.—Ed.]

Paper Making in California.

With the desire to aid in the advancement of home manufactures, we publish the following article on the subject of manufacturing paper in California. It is furnished by Mr. D. P. Tallmadge, to the Empire County Argus, and we learn that the writer was for a long time an extensive manufacturer of paper in New York: He says:

"The tule of this State is supposed to resemble the Papyrus, from which it is said paper was originally made, and that, therefore, our two million acres of tule lands will furnish an excellent stock of raw material for paper. There may be a resemblance, and indeed the tule may be as good, and must be twenty per cent. better than the papyrus itself, in order to furnish a profitable material for the manufacture of white paper. No papyrus ever grew equal to linen or cotton rags for the production of paper, such as is now required in market. If the reading world would be satisfied with newspapers and books printed on paper of a yellowish or gray color, instead of pure white, paper could be produced at much cheaper rates than at present. The difficulty is not in making paper out of straw, or tule, but in bringing the paper to the required standard of whiteness. The cost of bleaching these articles is fearful in the eyes of a manufacturer, when compared with the cost of whitening domestic rags or cordage, by any process now generally understood by paper makers.

"We have, in our time, tried many experiments in making paper from straw and other material, and never yet found anything equal to a linen rag. We have examined the tule, and believe that an article of paper can be made from it equal if not superior to straw paper, and combined with linen and cotton, the tule may form a valuable ingredient; but the manufacturer of paper encounters many difficulties in producing a good quality of paper from the stock now generally used, and these difficulties are greatly increased when resort is made to other vegetable fibre.

"Of the manufacture of paper in this State we have to say, that if a suitable location near San Francisco, could be found, the business might be made profitable. Perfectly clear water is absolutely necessary. We hope to see the experiment made on a larger scale, a one-horse power concern will never succeed. The market here is ample for several large mills, and coarse paper can be manufactured profitably beyond a doubt; and if the tule will make a good and white paper, we can from this source supply the world."—*Empire County Argus.*

Forest Trees.

At a recent sitting of the French Academy of Sciences, held in the city of Paris, M. Chevaudier developed a portion of the results of five years' study and experiments upon the *manuring of forests*, and the augmentation of their annual yield. This question has an interest in France which can hardly be understood in America, where the difficulty is rather to clear the ground of its woody growth, than to stimulate it to greater fruitfulness. M. Chevaudier commenced his experiments in 1847, believing it as possible to assist trees in their growth as flowers, grass, and animal plants. Why could not art intefere to restore to the soil the mineral substances withdrawn from it by the roots of the trees, and by them conveyed to their trunks and branches? Because woods spring up of themselves, and appear to flourish without the aid of man, was it not nevertheless probable that a system of amelioration of the soil might urge them to a more luxuriant vegetation? The great difficulty in the way of such attempts was the length of time necessary to devote to them. When Franklin wished to convince his fellow-citizens of the good effects of plaster of Paris upon a soil deficient in lime, he simply sprinkled, in the midst of a meadow, a quantity of powdered plaster, tracing several words in huge letters. A few weeks afterward the lime had sunk into the soil, but the words traced upon the meodow stood out from the rest by the richer color and the double height of the vegetation. But in order to convince one's self in sylva-culture, that such or such a manure or substance acts favorably or otherwise, study for whole years, and application of the system to a very large extent of land, were indispensable. After five years' steady devotion to this specially, M. Chevaudier communicated the substance of his discoveries to the Academy. He commenced his experiments by choosing, among the substances that their cheapness rendered accessible, such as could restore to the soil the elements of the azote or salt withdrawn from it for the support of the forest. As sources of azote he employed the salts of ammonium, as sources of mineral substances he used wood ashes, which contain the whole mineral portion of the wood before its combustion. He also tried lime, the salts of potash and of soda, the phosphate of bone lime, plaster and the sulphate of iron; and earthy substances, the residue of factories, or salts of potash and soda, (*oxy-sulphuret calcium*,) which had already been, and with advantage, tried in the valleys of the Vosges. It would be impossible to transcribe the tabular view drawn up by M. Chevaudier, which gives the individual history and the bill of health of five thousand five hundred and thirty subjects — pines, cedars, oaks, beeches, larches, &c., &c. I have only room for the general conclusion, which may be divided into four categories. 1st. Substances, whose fertilizing action was more or less marked. These were the oxy-sulphuret of calcium, the chlorydate of ammonia, plaster of Paris, wood-ashes, sulphate of ammonia, lime, non-calcined bones and phosphurette. 2d. Substances whose fertilizing effect was slightly marked or doubtful. These were, the carbonate of potash, coagulated blood, calcined bones, an equal mixture of nitrate of potash, non-calcined bones, sulphate of iron and carbonate of lime, and an equal mixture of nitrate of potash and non-calcined bones. 3d. Substances which seemed to have no effect at all—the carbonate of soda, the nitrate of potash and sea salt. 4th. Substances which seemed to have had an injurious effect—the sulphate of iron, and equal mixtures of sulphate of iron with lime. The residuum of soda and potash works, known by the name of the oxy-sulphuret of calcium, generally supposed to be utterly useless, has been proved by M. Chevaudier's experiments, to be the most wonderful substance ever employed for fertilizing purposes. It augments the growth of forests over one hundred per cent. In the neighborhood of soda works, there are huge piles of it, the accumulation of years. At Marseilles it is thrown into the sea, while there are, throughout the department, vast pine plantations upon which it might be applied with great advantage.—*Home Journal.*

Progress of Scientific Agriculture.

We have alluded heretofore to an article in the Edinburg Review on the progress of scientific agriculture, and presented some of its valuable suggestions to our readers. We again quote a series of observations from the same paper, and urge our readers to peruse the remarks with attention:

We could have wished, in answer to our own question, (What is now doing to hasten forward that increased productiveness of which the soil is capable?) to have dwelt for a time on the progress now so extensively making with the drain and the subsoil plow, and on the great results we are entitled to expect from a still wider, and more skillful adoption of these fundamental instruments of improvement. But these points of inquiry are already, in some

measure, understood. We shall turn, therefore, to the newer and higher branch of the subject—that on which imperfect information still widely prevails; in regard to which even fears and misgivings exist in the minds of some—the influence, namely, which science is fitted to exercise on the future improvement of the soil.

The questions—What has science hitherto done? What can it be expected yet to perform for the benefit of agriculture?—are at the present time of the great moment; because the general mind is awakened, in an unprecedented degree, to the necessity of doing something to elevate the art of culture to a level with the other useful arts; and because the three great bodies at once represent and guide the agriculture of the three kingdoms, are zealously striving which can do the most, in their respective spheres, towards the attaintment of this great object.

The Irish, the English, and the Scottish "National Agricultural Societies," are, as the circumstances of each country direct, following different main lines of improvement. Besides the bettering of the breeds of stock—which all encourage, perhaps, in too great a *proportionate* degree—the Irish Society is planting auxiliaries in the provinces—fixing centres, as it were, from which her future operations in each country may begin—is drawing attention to the drainage and improvement of bogs, and is diffusing among the peasant farmers of Ireland the elements of a better husbandry. The force of the English Society has hitherto been more especially expended, and certainly with great success, upon the mechanics of the art—on the improvement of the implements by which the stubborn clays of the country may be hereafter thoroughly subdued—and in collecting information as to what has already been done in different parts of England, with the view of discovering what she may herself most usefully endeavor to accomplish. This is consistent with English prudence, and full of future promise. The Highland Society, again, if not the parent, long at least the predecessor of both, having all her machinery perfect, and possessing full leisure to consider what both agriculture and the times require, if she does not quite lead, has not as yet lagged far behind the advance of knowledge. With limited means, she has for many years shown an increasing desire to enlist the aid of science in the cause of agriculture. This desire, as her published premiums show, is now stronger than ever; and ere another year passes, will, we are sure, be of national duty with us, therefore, briefly to point out the relations which the sciences, especially those of chemistry and geology, bear to the art of culture.

The progress of agricultural improvement, as we have seen, brings with it an increased demand for manures of easy transport. The supply gradually falls short of the demand, and their market value rises until they reach a kind of famine price; at which the corn they can be made to raise barely repays the cost of applying them. This high price, which at first appears to be an unmitigated evil, leads, however, to good in many ways. Perhaps the simplest and most intelligible way of treating our present subject will be, to follow in their order the successive effects or improvements to which this high price generally gives rise.

In the first place, it causes all *known* manures to be eagerly sought for and collected. The home dealer is stimulated to search for them in every quarter, and each bonemill employs its staff of humble collectors to perambulate towns and villages. Foreign and larger dealers spring up in the seaports. Our east coast puts the whole seaboard of Europe under requisition—whole fleets of merchantment from the west, skirt the Irish shores, or, crossing the Atlantic, bring the cargoes of bones from the United States; and even to Buenos Ayres and Montevideo, suggest a new article of export, in addition to the hides and tallow of their numberless cattle. Such is, perhaps, the earliest national advantage which springs from high prices and increased demand.

It is interesting enough to mark how agriculture and commerce thus mutually aid each other—how the wants of one country impart a new value even to the refuse substances of another, and afford a new employment to its idle population. But it is interesting still to observe how such a traffic commenced with a view to the benefit of our own farming interest, re-acts upon the minds of the agricultural population in those distant countries—awakening them to new desires, and leading them to increased skill in the art by which they live. Bones, for example, they come to think, may be useful at home, if it is worth the while of English merchants to bring them from so great a distance. How are they to be used, they ask, where and when applied, to what crops, on what soils, and after what preparation? Such questions call forth by degrees a vast amount of practical information, the diffusion of which has in Sweden already given rise to the complaint, that bones are not to be obtained by the home farmer, because of the high price offered by the exporters to England; and in the United States of America, to the reflection, that they are surely worth more for home consumption than the seven

or eight dollars a ton which the English agents pay for them. How striking to see the awakening intelligence of a few thousand agriculturists in our own island, thus rousing a spirit of inquiry, and actually pushing forward the art of culture in the most remote parts of the world.

A second and no less important consequence of this high price of manure, is the saving to which it leads of such as were previously wasted. It is only the more skilful farmers who use these comparatively costly substances in any considerable quantity. The less skilful cannot afford to use them. Their land is not in proper condition, perhaps because it is undrained, or they apply them after a wrong method, or at a wrong season; so that if by way of experiment they are tempted to try them, they suffer an actual money loss, and they are long deterred from employing them again. Nevertheless, the absolute value of manures of every kind rises in the estimation of every farmer, as that of portable manures increases. He comes to see that every waste of manure is an actual loss of money; and when satisfied of this, the slowest begins to move, and the most wedded to old customs to think of deviating from the method of their forefathers.

The instructed look with amazement when, on the borders of the Roman Campagna, they see whole hills of dung, the long accumulating refuse from the stables of the post house, or when on the breaking up of the winter's frost, they see the yearly collections from the farm-yard floated away on the ice of the Volga, almost literally realizing the times of the Ægean stables. We never dream that anything half so barbarous could, by possibility, happen among ourselves; and yet a visit to a hill-farm in Northumberland may show us the same winter accumulations emptied purposely on the side of a brook, that the waters may carry them off, or into some neighboring hollow, where they are least in the way and have been permitted to collect for entire generations. Such palpable waste is seldom seen, indeed, in the lower country, where intercourse is greater, and where knowledge and public opinion spread more widely, and exercise a more immediate influence; and yet the no less serious waste of the liquid from our farm-yards is still too widely prevalent, even in our better cultivated districts, and among our more improving and intelligent farmers. Within the last few weeks, we have walked over the farms of the first practical farmer of the Tyne-side, and of the most celebrated breeder in Yorkshire, and yet, from the fold-yard of the one, the liquid was conducted by a drain into the nearest ditch; and from the cow-houses of the other into a shallow open pond, where it stood reeking and fermenting beneath a blazing sun! What merit, as a farmer, can that man claim, who, though he annually lays five tons of guano, or bones, or rape-dust upon his farm, yet allows what is equal to ten or twenty tons of the same, to run to waste from his farm-yard in the form of liquid manure?

It is such waste as this that the high price of portable manure tends to check. It is now happily checking it here and there in various parts of the island; but it will be long before the evil is remedied over the general face of the country.

But after he has done everything in the way of saving what he had hitherto inadvertently neglected, the inquiring farmer still finds that his wants are not all supplied; that if he would farm high—raise, in other words, the largest possible produce from his land—he must still incur a considerable annual expense in the purchase of foreign manures. Can I not, he next asks himself—can I not *husband* these manures which cost me so much? Is there no way in which I can more economically apply them, so as, from the same quantity of manure, to obtain a larger return of roots or corn? This inquiry leads him to three successive mechanical improvements, as they may be called, which are severally applicable to one or other of the crops he cultivates. *First*, to put his manure into the ground immediately before he sows his crop in spring or summer, rather than in the preceding autumn. This is a result of the same system of saving to which we have already adverted. By examining the waters which escape from the drains during winter—upon his thorough drained land—he finds that they actually carry with them a portion of the manure he had previously laid upon his fields in the autumn, and that thus he had unconsciously suffered a partial loss. To put it in, therefore, only when spring arrives, will ensure him a certain saving. *Second*, to deposite the manure in the drills when his seed is sown, putting it all within reach of the plant, and wasting none of it on the unprofitable or unproductive part of the soil. And, *third*, with the drop-drill to bury it only beside the seeds it is intended to nourish, and thus more perfectly to effect what laying along the whole drill had only in part accomplished. These methods husband his manures, and, at the same time, call in the aid of the ingenious mechanic to furnish cheap and efficient implements, by which the several operations may be easily performed. They may not be applicable to all his crops, and there are certain circumstances under which

the intelligent practical man will wisely refrain from fully adopting any one of them; but they are valuable illustrations of rural *economy*, nevertheless, and of the line along which improvement will proceed, in endeavoring "to raise the largest amount of produce, in the shortest time, at the smallest cost, and with the least permanent injury to the land."*

But the same desire to husband his manures, leads him also to what may be called a chemical improvement in the form in which he applies them. "If," says he, "as chemists tell me, the roots of the plant drink in only that which is in a liquid form, the manures which are already in a liquid state, or in such a condition, at least, that the rains will readily dissolve them, should be more immediately useful in the nourishment of my crops. If I apply dry bones to my turnips, they must take a considerable time to become soluble, and may not yield all their substance to the growing bulb before its period of maturity arrives; and though the residue of the bones left in the soil does benefit the after crop, still the rains of winter must wash away some of their constituents, and thus occasion to me a variable loss. Would not the same quantity of bones or rape-dust, or even of guano, go further in the production of corn, or potatoes, or turnips, if I could apply all their constituents to my land in a fluid form?" Theory and experiment both answer these questions in the affirmative. Recent experiments, especially upon the action of bones, dissolved in sulphuric acid, have thrown new light upon this subject; and though too hasty inferences have by some been drawn from them, and the benefits to be derived from the new method have been exaggerated, and unreasonable expectations have consequently been excited, yet such good may fairly be expected from the use of the liquid form of applying manures, as will encourage, we hope, the continuance and extension of experimental inquiry.

Here, also, the mechanical contriver has been called in, and premiums have been offered and received for liquid manure carts and other implements for the economical application of manures in the fluid form. We should appear to be behind the knowledge of the day upon this matter, were we not to allude to the method which Mr. Smith and some of his friends have proposed for distributing liquid manures on a large scale, and over entire farms. He builds a tower one hundred and twenty feet high; to the top of this tower he pumps up his manures—he conducts them by pipes to the several fields of the farm, and, without shifting his position, he squirts a fertilizing shower over whole acres at once. We are unwilling hastily to condemn, and more unwilling to ridicule, anything which Mr. Smith proposes or supports; we shall wait patiently, therefore, for the result of the trial he is about to make of an actual tower upon a farm in Lancashire. If any practical measure can be devised for working up the waste liquids of our large towns, a great national good will certainly be effected.

Yet all these contrivances do not materially reduce the price of our known and available manures; because, as we have seen in an improving country like ours, the demand increases as rapidly as the supply. Other sources of supply are looked for, and substances, not hitherto known to possess fertilizing properties, are collected for the use of the farmer. The refuse of the sugar-boiler, of the glue manufacturer, of the miller, the malterer, the currier, the horn and knife-handle manufacturer, and even to the hair-cutter, are all collected and readily sold as manures; because they are shown by the chemist to consist of the same animal and vegetable substances which, in other forms, are known greatly to benefit the land.

Special manufactories for the preparation of manures next spring up. The first object taken up in most countries by these manufactories, is to give a portable and less perishable and offensive form to the night soil and urine of the larger towns. Here chemistry is more *directly* and obviously employed in the service of the farmer, and under the names of *poudrette*, animalized carbon, and *humus*, or of urate and sulphated urine, these substances are recommended to the practical man by the new race of dealers to which his wants have given rise. To meet the ignorance and quackery with which some of their number assail him, and to arm himself against imposition, the farmer must now acquire some scientific knowledge himself; or must have a ready means of access to scientific men, on whose skill and integrity he can rely.

Meantime observations of another kind accumulate which gradually bring into use an entirely new class of substances as fertilizers of the land. From the most remote times, and in all countries, animal and vegetable substances have been principally employed as manures; and the farmers are comparatively few in number still, who will believe that their crops can be *fed* by anything they can add to the soil which is not either of animal or of vegetable origin. But here and there solitary cases have always been observed, in which substances dug out of the soil, and obviously neither

*Johnston's Elements of Agricultural Chemistry and Geology.

of animal nor of vegetable origin, have greatly promoted the growth of our cultivated crops. In some places sea salt, in others wood ashes, in Italy and Egypt the natron, or soda, which encrusts the plains of the latter country, in India its native saltpetre, over the whole States in Germany and North America, crushed gypsum or plaster, and everywhere, almost without exception, marl, and shell-sand, and lime, are known to impart new fertility to the soil, and renewed vigor to the growing crops. Such substances as these, however, were not regarded as manures—they were supposed merely to *stimulate* the plant to an extraordinary growth for the time, leaving the ground, like a drunkard after a debauch, proportionably weaker and less fertile for the future. Thus their use was checked, limited, and looked upon with suspicion. They appeared to fertilize, while in reality they robbed the land. They increased the present but diminished the future crops, they enriched the fathers, but impoverished the sons.

There were not wanting many, indeed, who opposed this view, and quoted cases in which these substances had been employed, for a long series of years, without producing such injurious effects; but still, agricultural feeling and opinion were against them, and they have as yet but partially prevailed. Even the introduction of nitrate of soda from Peru, at a comparatively cheap rate, and the publication of the remarkable effects it was seen to produce, have been unable to bring these mineral substances into general favor. Since the introduction of guano, nitrate of soda, as an application by itself, has been almost forgotten; and bones, rape-cake, and guano, all of which are considered as true manures, are still the main dependence of those who cultivate their lands by the aid of portable manures.

This unwillingness to employ, or to rely upon saline substances as manures, has been aided by another series of observations of great interest and of important practical consequence, the true explanation of which is even now but little understood by practical men. The scientific investigation of them, however, has led to the discovery of the most beautiful physiological principles, and to the clearest demonstration of the value of chemical science to agricultural practice.

It was found, for example, that, though in some countries and upon some soils, the use of gypsum, saltpetre, common salt, and other similar substances, produced strikingly beneficial results, yet that upon other soils, and in other localities, they produced no sensible effect at all. How was this to be accounted for? If these substances merely acted as stimulants, why were they incapable of stimulating a poor and laggard crop in one soil as well as in another? The difference of their action in the several circumstances must depend upon some difference in the soils themselves.

Then chemistry was asked to analyze these soils—a work at first but unskilfully performed, and still very rarely completed with accuracy and care. This has arisen in part from the inherent difficulties of the process, and partly from the little remuneration of any kind, either for time or skill, which those most deeply interested in such inquiries have offered to the chemical investigator. So little, indeed, is skill understood by practical men of the analytical (the highest branch of the chemical) art, that the rigorous analysis of a soil is looked upon as the work of a few hours, or, at the utmost, of two or three days only; and the money or other value attached to the discovery of this or that ingredient, is judged of accordingly. In this line the largest amount of work hitherto done has been performed by the German agricultural chemist, Sprengel, and is recorded in his work upon soils, of which we have, among other publications, prefixed the title to the present article. The accuracy of Sprengel has recently been impugned by Liebig, in that *fortiter in re* style he usually employs in reference to those with whom he happens to differ. But we are not inclined to go along with him in his sweeping condemnation of *all* Sprengel's analyses; and we cannot agree ungraciously to reject the entire labors of a long life, expended upon a branch to which no other equally skilful chemist had, for nearly twenty years, thought proper to turn his attention.

Now, through the labors of Sprengel chiefly, not solely, for he had predecessors and cotemporaries also, though less laborious, and less clear and decided in their opinions than himself, it has been established regarding soils:

1. That they all contain a certain portion of organic, chiefly vegetable, matter, which readily burns away when they are heated to redness in the air. This combustible matter in peaty soils sometimes amounts to fifty or sixty per cent. of the whole weight; while in clay soils, such as the white, undrained clays of Lanarkshire, less than one per cent. is present.

2. That in all naturally fertile soils, the incombustible part contains a notable quantity of each of ten or eleven different mineral substances.

3. That soils in which one or more of these substances is either wholly wanting

or is not present in sufficient quantity, will not produce good crop.

4. That to these latter soils what is wanting may be artificially added, and that thus their fertility may be increased, restored, or maintained.

5. That some of these substances, when present in excess in the soil, become noxious to the plant; and that, to render such a soil productive, this excess must be, in some way or other, removed.

These five propositions comprehend nearly all that is of importance, in regard to the incombustible part of the soil. They are fully and frequently stated in the works of Sprengel. They are illustrated and enforced in those of Liebig and Johnston. It would interfere with our present purpose to dwell upon the combustible or organic part of the soil.

But, with the aid of these propositions, the general doctrine of soils, and the action of saline or mineral manures, becomes so far clear and simple. A soil, to be fertile, must contain ten or eleven known substances. If any of these be altogether absent, you will improve your soil by adding them to it; if they are present, the addition of them will do no good. If salt or gypsum, for example, or the ingredients of wood ashes, be wholly absent, you will obtain large crops by adding these substances largely to the soil; if they are merely deficient, a smaller application will be of service; if they are already present in sufficient quantity, any application of them to the soil will be so much money thrown away.

Entomological Survey of New York.

An excellent work is in progress in the Empire State, and an energetic laborer is in the field, from whose observations and reports we may hope to derive mucb valuable information. The following is from the Journal of the N. York Agricultural Society:

Under date of June 27, Dr. Fitch writes:

"I have already found more than a dozen different species of undescribed worms, feeding upon the foliage of the apple tree; and other new ones are appearing every few days. These I am feeding, to breed from them the perfect insects—saving, in a herbarium, specimens of the leaves, showing how they are cut and gnawed by each kind of worm. The Palmer Worm that made such havoc in our orchards here last year, would scarcely be noticed this year, it is so scarce.

"I have had the good luck to find the Hessian Fly, and have procured specimens of the wheat stalks, for the Agricultural Museum, and for the Paris Museum, fully illustrating its history.

"In addition to the insects on fruit trees, my attention this season has thus far been all taken up by the bark-lice (Family Coccidæ, of which, now when I come to search for them, I find a species on almost every kind of tree and shrub we have. Limbs of the peach and some other trees, killed or very sickly from being infested with these lice, I have in readiness for the Museum.

"In spite of all my exertions, some worms upon the fruit trees are eluding my scrutiny. Yesterday I met with some apple-tree leaves that had been ruined by a leaf-mining moth that has already completed its growth and left the leaves.

Our rose-leaves are at present being wholly killed by the slug-worm (Selandria Rosæ, HARRIS), and the cherry leaves are beginning to be infested with the species peculiar to them.

"I had intended to have gone to Long Island again, about this time, but I find more work here at home than I can attend to; and the worms I have gathered require to be fed and nursed with even more regularity and care than a flock of Saxony sheep in winter. Some of them die in confinement, in spite of all the pains I take with them.

"I must this season take one trip to Onondaga Salt Marshes, and to Niagara—where are, undoubtedly, several species of insects different from those which occur here, and which will require notice in an account of the Insects of the State. But I find that here at home, where I have tools and every thing convenient to my hands, and the whole time at my disposal, I accumulate facts much faster than when abroad."

Writing, August 24, from East Greenwich, Washington county, he says:

"The drouth prevailing here has never been paralleled. Batten-Kill has never been known so low. Fires are raging in the woods in several places around, doing great damage. Some insects, plant-lice, in particular, seem to be favored by this weather. I see a newspaper notice of a bug, as being very numerous and destructive to vegetation in Cattaraugus county, since the coming on of this drouth. I purpose visiting that neighborhood, and hope to ascertain whether this is anything of importance."

New Plants.

CISSUS DISCOLOR.

Whatever may be said of variegated foliage being a sign, or concomitant of disease, there can be no question, that among the masses, beautiful variegated plants will ever be looked upon with admiration. We have frequently noticed that this plant, and the one immediately to follow it, have arrested whole companies of admirers, when fine specimens of other flowers were passed by comparatively unnoticed. The flowers of this plant, like others of the same family, are not worth looking at. It makes the best appearance when encouraged to climb and hang from a fair-sized trellis, the supporting medium being wholly concealed by shoots and largish leaves; these latter having a beautiful crimson color underneath, and splashed and spotted with white on the surface.

For this beautiful gem we are indebted to the Messrs. Rollison; a firm, to whom is greatly owing the awakening of the taste for admiring and possessing variegated plants. I am not quite sure of the period of its introduction from Java. Its island habitat, however, is of more importance than the day of its introduction. Although there are mountain ranges in Java, I am not aware that any of them are so lofty as greatly to influence the temperature of what is next to a sun vertical, tropical climate. Most of our readers will, therefore, be aware, that throughout the year, the day and night will not vary, at the greatest, more than an hour in length, and that the temperature also will be somewhat uniform, averaging about 80° of Fahrenheit. Unless for short intervals, it will thus be manifest, that this plant requires the temperature of a warm plant-stove to grow and obtain its greatest amount of beauty. This we can only expect to do in this country during the spring, summer, and autumn months; and during these seasons, when previously well grown, I have seen the plant remain quite healthy and beautiful, in a temperature ranging from 60° to 70°, and even a few degrees lower than the first-named figure. To maintain the plant in beautiful condition all through the winter, will require a temperature seldom below 70°; and even then, for want of sunlight, it is doubtful if its natural characteristics could be fully maintained. Like many other plants that become extremely pliant and flexible to our management, I have no doubt that this plant may be *kept* in winter, at a temperature of from 50° to 60°, but then it must be *risked;* comparatively little air given, and most, or the whole of the leaves, be expected to fall, and especially if the thermometer at all falls below 50°. So far as the future beauty of the plant is concerned, this deciduous state, or nearly so, in winter, is no disadvantage, as, when the sun gains strength in the spring, the buds will begin to break under an increased temperature, when, in old-established plants, the young shoots should be pruned back, and, ere long, under the increasing light and augmented heat, the plant will again be covered with its striking foliage. I mention this, because many might be disposed to sacrifice the beauty of the plant in winter, if they could secure it in summer, without such an expenditure in fuel. Many things, comparatively tender, may be *kept* in a coolish greenhouse, rather dry, if placed at the warmest end, under a handlight that fitted rather close, and which was duly covered at night and cold mornings. When this plant is fairly growing, it will not be easy to give it too much heat and atmospheric moisture.

Propagation.—Short young shoots, two or three inches in length, strike easily in sand over well-drained peat and loam, in a pot, plunged in bottom-heat and covered with a bell-glass, the temperature being from 70° to 80°. But these stiff shoots are obtainable chiefly in spring, just after the plant has commenced fresh growth after being pruned. At other seasons, during the summer, it will be always easy to procure small, thin, long-jointed shoots, appearing almost like half shoot, half tendril appendages. Many have complained to me that they could not get on with striking this plant, the cuttings kept damping-off so; and I apprehend the difficulty arose from waiting too long, and using these puny, drawn shoots for the purpose. Now, there are several climbers that, just like this *Cissus*, are rather troublesome to strike, in the usual way, from such thin and drawn shoots; and yet they can be struck successfully by just departing a little out of the usual routine.

The best method to adopt with these small climbing, or dangling shoots, is as follows:—Take a piece of these shoots, with its growing point left untouched, and from six to twelve, or even eighteen inches

in length. Cut across with a sharp knife at a joint, and remove the leaves there, and if the shoot is long, a few of the upper larger leaves also. Daub the base of the cutting into a little charcoal-dust, and then let it lay a few minutes. Previously, according to the size of the cutting, a three or four-inch pot should have been prepared, filled to within an-inch-and-a half of the top with drainage, and then with bruised charcoal, sand and peat, an inch, covered with sand a quarter-of-an-inch thick. This should then have been watered and allowed to settle, and get dryish on the surface. Have a few little pegs, or hooked sticks, ready; take the cutting, and do not dibble it in the sand in the usual way, but place its end horizontally close to the side of the pot, and just hardly covered with the sand. Lay the shoot round in volute fashion, on the sand, by the side of the pot, keeping it there by pegs, and leaving only the point free and at liberty; then place the pot inside of a larger one, with moss stuffed between them; and then get a bell-glass on the moss between the pots; water, and allow to dry before the glass is put on; plunge, then, in a good bottom-heat, shade from sunshine, and prevent damping by a little elevation on one side of the bell-glass at night; and these *unlikely* shoots of these and other climbing plants will furnish good, strong plants.

Soil.—When young, this should chiefly consist of fibry-peat, leaf-mould, and sand, with a little charcoal. As the plant increases in size, fibry-loam should be added, until it amounts to a third, and a little dried old cow-dung may be added to the leaf-mould, and this will cause the plant to be stubbier in habit than if grown in peat-earth almost alone.

Position.—This has already been indicated. It is next to impossible to give it too much of a moist heat. If forced by dung-heat, great care must be taken that no steam reaches it. A shady place suits it best, when making fresh growth at first, and more light to give the coloring to the leaves afterwards. A fair portion of water, heated to the temperature of the atmosphere of the house, or, rather, a few degrees higher, will be wanted when growing freely, and an atmosphere near the saturation point; but unless in extreme cases, such as to promote cleanliness, the syringe should seldom touch the foliage.

COLEUS BLUMEI.

This is, likewise, a plant, with beautiful foliage, from Java, introduced, I believe, by Mr. Low, of Clapton, and sent by him to the Royal Gardens, or rather, the People's Gardens, at Kew; for right well do the people enjoy and appreciate the improvements, and the access to witness them, which have been effected there. This genus *Coleus* is something of an offshoot of, or near neighbor to, the genus *Plectranthus*; and, were my love for notoriety and conservative distinction much greater than is ever likely to come in my way, I would be apt to envy the gentleman whose name it bears. In our younger days, the coarse-growing *Plectranthus racemosus* used to be greatly grown in windows, its green foliage, and something-like-balm fragrance, making up for its roughness, and the long spikes of diminutive, greyish flowers. The flowers of this *Coleus Blumei* are rather better colored, a bluish purple and white, and, in young plants, the spikes are of great length, though the individual flowers be small. But the foliage is the great attraction,—jagged, and of a yellowish-green at the sides, while the most of the leaf is rayed and splashed with a rich crimson-purple. Though from the same island as the *Cissus*, it seems to stand much rougher treatment during summer. As to propagating, it is mere child's play. A few nice young shoots, a little firm at the bottom, placed round the sides of a pot, in sandy soil, and plunged in a briskish heat, in a shady place; and in a week they will be getting quite anxious to be potted off.

Such a sensation did the little gem create, that I could not resist the temptation to have it tried extensively in windows and greenhouses, and reports were favorable from all places until the cold weather came, and now I get teazed out of measure, as to how, in such places, the plants are to be kept healthy. I had a large plant, that stood in a cool glass veranda, in perfect health, from the middle of June to the end of October, though towards the last the leaves formed were very small. I have been vexed since, that this old plant was thrown to the rubbish-heap, as I could have better measured the cold it would have indured, than by younger plants. The appearance of the latter seem to say, that they will require a temperature from 50° to 60°, to keep them endurable, and 60° and onwards, to keep the beauty of the foliage in perfection. As in the case of the *Cissus*, I am not yet sure that can be done in our dark winters; and allowing the plants to shed their largest and best leaves, under comparatively a lower temperature than it was used to at home, may both be the cheapest and best way of keeping it here.

A plant-stove, moderately heated, seems, however, to be indispensable in winter, though those who can place a small plant

or two in a warm greenhouse, in a good position, and with the extra protection of a hand-light, may succeed, if it does not get below 45° at night. Without this, I fear its admirers for a window or a greenhouse, in summer, must get cuttings in May or April, and strike them in their Cucumber-bed. It is not at all particular as to soil. It seemed to thrive in all kinds, provided it was moderately rich and open. It took in manure-waterings with great gusto, if not too fresh, nor too strong. A little shade is useful at first. Like the *Cissus*, when you wish it to grow fast, it can scarcely have too much heat and atmospheric moisture. R. Fish.

Old and New Modes of Growing the Chrysanthemum.

When I was revolving in my own mind, the other day, for my autobiography, the things which were done and said about gardening, when I was driven into the garden, I began to wonder how very few discoveries have been made in and about the garden, from that day to this. There was no hope for me then to begin to *learn by experience*, at twenty years of age, all that was necessary for a man to know to enable him to plant Cabbages, even if the ground was lined off for him; and so I was driven *into* books the very next day, to make up for lost time. To pay up the debt for the urgent and most valuable assistance which I received from books at the beginning of this journey, is the sole reason of my earnestness for improving our books and practice at the close of it.

Lest I should again forget to mention it, and regretting that I forgot it during my own practice, I shall first mention an ingenious experiment which I saw begun, under very favorable circumstances, in the summer of 1825, but the result has not yet been proved, although it might be proved in eighteen months. This experiment was tried on a new *Chrysanthemum*, and most of them were new at that day, in Edinburgh, and beyond it. However, all plants which were new and good were to be seen with Lady Gordon Cumming, at Altyre, sooner than anywhere else in those parts. She was fond of the sciences; a proficient in many branches of science herself; and her house and purse were always open to men of science, who were delighted to favor her in return, with specimens and seeds from all parts of the world; and from China, among the rest. Her garden was an experimental garden, in a literal sense; and she was the ruling power, the guide, and experimentalist, in disguise. No one but her head-gardener, and one or two of the assistants, knew that every experiment was proposed, and the plan of carrying it out suggested by Lady Cumming. Great people appear greater, when this trait in their character is understood. Lady Middleton proposed, suggested, and, with Sir William settled before-hand, everything I did at Shrubland Park, and they gave me the credit of it, and wished the world to believe it due to me. How different from some *who would be great*; but I am not preaching a sermon, I was only going to mention the ingenious experiment which Lady Cumming wished her gardener, Mr. Temple, to try in the summer of 1825, but some family arrangement called him away from the north; and the first thing which his successor, Mr. McLean, from Lee's Nursery, did, was to upset all the experiments and plans of Mr. Temple; but he kept all the old garden hands till he learned to whistle the family tune, and he did well; but the ingenious experiment was forgotten from that day till one day last week, when it came into my head, no doubt, on good purpose. If I had thought of it sooner and had proved it, as I think it will be by some one else, it would make me feel proud of myself, and I ought to be thankful that I forgot it till now.

The way Chrysanthemums were grown and flowered at Altyre, thirty years since, is now patronised by the Chrysanthemum Society of Stoke Newington, near London, for getting cut-blooms of the largest size. That way is to make cuttings of the best suckers on the old shoots, one or three in a small pot, some time in April, and to report them as soon as they root; to get them out in front of a south wall early in June; to plunge the pots to the rim, and no more, in front of the wall, but not close to it, after the first fortnight; and never to stop them on any account whatever, but to encourage them, by liquid-manure, once or twice a week, from the day they were first plunged, not from the day they showed flower-buds,—as if they wished for dwarf plants, by turning them round and round to the sun from time to time, and by thinning the flower-buds as soon as the best placed of them, and the largest in size, could be made out, and only leaving one, two or three flowers to expand on one plant. By having three plants in a pot, without branches, and three flowers on each top, the long stems could easily be drawn together with a piece of matting, so as to appear as if they were but one head after all. Plants thus treated rise from three to six feet high, according to the size, and produce blooms of enormous size—much

larger, indeed, than by any other method. The plan is not a bad one either for some parts of most of the large conservatories. It would be the best plan of growing Chrysanthemums to stand among the Rhododendrons and Camelias in the Chrystal Palace, where you could only see the tops; but the style would never do where the pots and plants could all be seen at once.

Well, that was the plan — the single stem—at the period I am writing about. The plants were then placed among other tall plants, so as to hide the tallness of the stems, and to show the flowers only up among the tall plants; but we *forced* them. At the beginning of September the plants were housed, and a few of them were put into the stove; the extra length caused by forcing was considered no detriment then, and we had them "in" by the beginning of October. As soon as they were out of bloom, we did not turn them aside as we do now-a-days, but rather put them into the pine-stoves, on the side curbs, without cutting them down, except a little at the top with the dead flowers. The Chrysanthemum will stand the heat of the stove in winter, and seems to like it; the tall stems never seem to want cutting down—at least our's did not—and the suckers were pulled off as fast as they appeared, and cuttings were then made of the upper branches only; about the end of March they were removed to the greenhouse; and they were planted out with the Dahlias, in the borders, in May, where they soon made great, bushy plants, as tall as Salvias. Some kinds would flower well the following autumn; after that they were dug over as good-for-nothing.

About this time, it was rumored that Chrysanthemums sported, both in China and in England; that is, that a branch, here and there, would, occasionally, give flowers of a different color from the rest on the plant, and when cuttings were instantly made from the sporting branch, the new color would follow and become permanent. Now, this curious disposition to sport was made the foundation of the ingenious experiment, which I want particularly to be settled next year, or the following year, at the farthest. The particular experiment was tried on a sport, but I should think any kind would do; at all events, the thing has not been proved either way. The *rationale* of the plan was founded on the fact, that a bud from a variegated Jasamine, inserted into a green-leaved Jasamine, will cause all the green leaves to turn variegated also; even if the variegated bud should die before all the leaves tinged with the matter which caused the change. To follow up this idea on a plant of Chrysanthemum, which was known to be naturally disposed to change, or sport, five or six different kinds were grafted on one such plant in May, and on side-branches high up on an old stem which wintered in the stove; then, by thus compelling so many different kinds to circulate their juices in the body of a plant, already noted for a sporting character, it was reasonably expected that the chances of inducing a still farther change from the normal type, would be increased five or six fold, according to the number of different kinds grafted; but, as I have said already, the experiment was not completed, and the question remains open to this day, although I might have made a fortune by it long since. [Had he been successful, which I think is very doubtful, Ed.]

It remains for me now only to point out the experiment to others, and in doing so, there is a second experiment which I wish to connect with it, and one which is as likely as not to be of still greater use to British gardeners; I mean, that an attempt should be made to cause the Chrysanthemum to seed with us as freely as the Dahlia; and why not? Our present plan of turning our plant into an annual, is one great cause why it does not seed with us, that cannot be gainsayed by anything we know of in physiolgy; a second cause of barrenness is, making cuttings from the suckers only. It stands to reason and science, if there is any difference between them, that the blood or sap, in a sucker of any plant whatever, is of the same degree, say of manhood, as that in the branches in the upper parts of the same plant. There is not the smallest question about the very different degrees of strength, ripeness, development, or manhood, or whatever we choose to call it, in the sap of a limb or branch, and the sap in a sucker fresh rising from the roots; then, if age, firmness of wood, or ripeness, and *infirmity* of constitution, by age, accident, or by the hand of man, are less inimical to fruitfulness than youth, vigor, and bad blood, in the vegetable kingdom, we have the two to choose from, in the present system of propagating, and the mode of managing the Chrysanthemum, and in that which we followed in 1825. The inference is perfectly correct; but the result remains to be proved. I have not the smallest doubt in my own mind, but the present heads of Chrysanthemums may be kept alive and in good health, to bloom every year, as long as I live, or as long as a Gooseberry-top; and I can conceive the possibility of some of these heads, at least, arriving at manhood, when they may be as prone to seed in England as they are at present to throw up watery suckers, from which we are content to raise gaudy

flowers and thus leave the chance of good seedlings to foreign gardeners, under a better climate. The French "our allies," were the first to find out the doubling propensity of Dahlias; and the Italians are now first on the list with *Pompone* Chrysanthemums at least; but who can say, that we, ourselves, will not excel them both, and all the rest of them, if we but go the right way about it.

Do, or not do, the load lay heavy upon me for the last ten days or so, and I could not sleep comfortably under it. New Chrysanthemums we must have, some way or other; new shades, and new shapes, and, as the old Roman said, "if you do not find a better way than mine, use it till you do." Save a few of your choicest kinds, this winter, in the stove, or any where else, from the frost; remove the suckers as fast as they come; if the plants are three feet high, cut off one foot, and so on in proportion to other height; if there are many shoots, all the better; thin them as they do Raspberry-stools; three of the strongest keep in an eight-inch pot, and only four in the eleven-inch size. I would not keep a larger size, and I would not disturb the roots for years, in case old roots, like old branches, may assist the plants to seed; but in the way to that stage, take the chances of a sport, by grafting as many different kinds, next May or June, as you can stick on. Should no sports appear for the next two years, nothing is lost; you have still two strings to your bow, the chance of sport, and the sure way of bringing all the grafts into a seeding age and condition. Two birds were never killed with so little shot and powder, and so good an aim.

But is there no easier way? I really think there is; but I am not certain of it. If we, or rather you, as I am out of it now, could get rid of the suckers altogether, it would be a real help in these experiments. I am firmly of opinion that all suckers can be got rid of by the process which keeps off suckers from Gooseberries and other bushes, which is, to get rid of the bottom eyes or buds, when you make the cuttings. Therefore, if you understand the drift of the story, the best way will be to keep some plants with all the present shoots standing till next March, and then to thin them as I propose, and make your cuttings from the middle parts of the old stems, instead of from the suckers in the usual way; then, if you make the cuttings four or six inches long—they will root if you make them ever so long—then, with a deep cut above the eye, and another deep cut under it, you will get it out with all its roots, if it has any; if you do so with all the bottom eyes, and leave four or five, or even three eyes at the top to form a head, it strikes me you will never see another sucker on any of them. When they are rooted, potted off, and quite established, you must call them stocks, and the grafts will take to them all the better, at the proper time, that is, when the shoots are long enough and firm enough to take the grafts. I would not graft them very close to the main leader or trunk, so that a shoot or two of the stock may rise as well as the graft, to form a head. I would graft in the simple splice way, as they do the Larch, at Mr. Jackson's, which I mentioned the other day. I would bind the graft with worsted, and tie a little moss over it, then put it under a hand-glass till the grafts had taken. There are many who do not care a fig about experiments of this sort; yea, who think other people are half mad to think of such things; but every body likes a nice-looking plant, and, therefore, everybody must graft six kinds of Chrysanthemums on one sort, for the look of the thing; for there never was such a nice way of seeing them before.—*Cottage Gardener*.

Novelties at Sion House.

I was very lately at Sion House, Isleworth, the residence of the Duke of Northumberland. This place has been for many years famous for gardening, and for a fine collection of rare hardy trees and shrubs, but more especially for a curvilinear exotic stove-house, in which are cultivated tropical fruits, bearing shrubs and trees. The late Duke had quite a passion for this particular branch of horticulture, and spared no expense in procuring plants of every kind of fruit from the warmest regions of the earth. Many of these have already borne fruit, and have been exhibited by his successful gardener, Mr. Iveson, at the Metropolitan exhibitions, surprising very much the visitors to these shows by their singular forms. Such fruits as the Papavo, the Vanilla, the Nutmeg, the Guava, and the Rose-Apple; but the most desired of all, the *Mangosteen*, and the *Durion*, had not produced any fruit till this year, or rather autumn. The former, the Mangosteen, showed flowers then, and has set some fruit, which I saw. The Durion trees are but small, and probably will not fruit for some time yet. This Mangosteen, which is the native name, is the *Garcinia Mangostana* of Linnæus, and is a native of the Molucca Islands, in the East Indies. It is a tree rising twenty feet high, with a stem gradually tapering, and branches that regularly lessen in length

towards the top; hence it forms a very handsome tree. The leaves are oval, seven or eight inches long, strongly nerved, and of a rich dark green. The flower has a resemblance to a small single rose. The fruit, when fully grown, is the size of a middling Orange; the shell like that of the Pomegranate, the inside of a rose-color, divided by thin partitions like the Orange. These divisions are filled with a soft juicy pulp, of a delicious flavor, akin to that of the Grape and the Strawberry combined.

This tree is named in honor of Dr. Garcia, who says, in the "Philosophical Transactions," "That it is esteemed the most delicious of the East Indian fruits, and a great deal of it may be eaten without any harm, and it is the only fruit that sick people are allowed to eat without scruple." Dr. Solander, in the last stage of a putrid fever, in Batavia, found himself insensibly recovering, by sucking this delicious and refreshing fruit. The pulp has a happy mixture of the tart and the sweet, and is no less salutary than pleasant.

This excellent fruit is, as I stated above, now swelling off in the tropical fruit-stove at Sion House. It is the first time it has fruited in Europe. It is growing in a large box, plunged in the soil, with about a foot of charcoal all around the box. This charcoal, Mr. Iveson informed me, was frequently watered, to yield atmospheric moisture. There are three or four other trees of the same kind in the house, but not yet in fruit. This tropical exotic house is divided into three. In a separate one is another large tree of the Mangosteen, much larger, more thickly branched, and with smaller leaves. It has not fruited, and probably is a variety that is shy to fruit. This variety may be the kind that has been hitherto cultivated in other places, without success, in producing its fruit. If this be the fact, of which I have little doubt, we may now look forward to the day when Mangosteens will be as easily and as plentifully grown and fruited in our hothouses as the Pine-apple. Great credit is due to Mr. Iveson for his successful method of bringing this fine fruit of eastern climes into a bearing state. The temperature that it requires is not above reach, for the thermometer indicated only 72 deg., yet the trees were evidently in a growing state.

To ensure having plants of the fruit-bearing variety, they should be propagated by cuttings or grafts from such fruitful trees.

In the same houses, I noticed the Chocolate tree, *Theobroma cacao*, showing abundance of fruit buds. They are produced on the trunk of the tree! and in that respect are a very great curiosity. The famed Nutmeg. *Myristica moschata*, was in fruit. This tree has been in fruit here for a long time. The tree is about twelve feet high. The fruit is about the size of a Burgundy Pear, and when ripe, splits open, and shows the nut inclosed in an arillus or stringy covering, which is the male. So that the tree produces in one fruit both the Nutmeg and the Mace of Commerce.

Besides these, the Coffee-tree was in fruit, the berries having some resemblance to ripe cherries; and the Vanilla plant had several bunches of its perfume-bearing fruit; and the Papaw was in flower.—*Cottage Gardener.*

Roots of Plants.

As the roots of Plants are the chief medium through which they receive nourishment, some account of their structure, and of the curious and simple mode by which they effect their object, will prove of some utility.

The root may be defined to be that portion of the plant which grows in an opposite direction to the stem; and differing from the latter in its remarkable downward tendency, and from its disposition to shun the light of day. So powerful, indeed, is the disposition to descend, "that no known force is sufficient to overcome it." The chief object of the root appears to be that of fixing the plant firmly in the earth, and of taking up a supply of moisture from the humid medium by which it is surrounded. It usually consists of several ramifications, from the sides and extremities of which, without any apparent order or regularity, proceed an indefinite number of delicate fibrils with spongy points. Now these fibrils are the only true roots, and to their soft extremities (spongelets) is consigned the whole office of absorbing fluid; the more woody portion of the root merely serving as canals, to convey the fluid thus obtained to the upper parts of the plant. The roots generally pierce the soil in a downward or horizontal direction, according to the individual habit, but more especially in that course which offers the least resistance, and yields the greatest quantity of soluble food. Hence the propriety of mulching is, by some gardeners, called into question, because the richness of the mulching material, and the warmth produced by its fermentation, has a tendency to attract to the surface the young fibrils. And then, upon the removal of the manure employed in the operation, their extremely succulent and tender tips become exposed to the influence of drouth, &c., than which nothing can be more injurious, as it quickly destroys their absorbing power, and thus

deprives the plant of its chief source of nourishment. It has been said that the fibrils are the only true roots, and that the feeding function is chiefly confined to the lax tissue of their extreme points. That this is really the case, there can be no reasonable cause to doubt, or why should the success of planting depend so materially upon their preservation? it being a well-known fact, that subjects of any size, such as fruit trees, are invariably less prolific the first season after transplantation than on the previous and ensuing years. Why these little spongelets should possess the power of absorbing moisture with great force, and of transmitting it to every part of the plant, is a curious question, and has given rise to many ingenious conjectures. But it has at length been satisfactorily answered by that clever French author, M. Dutrocet. If a small glass tube, having its end covered with a piece of bladder, be partially filled with gum-water, and then plunged into simple water, sufficient to wet the outside of the bladder, the latter will be permeated by the water, and the volume within the tube will continue to increase, so long as the density of the fluids on each side of the intervening membrane remains unequal. "But there is also a contrary current to less amount—the interior fluid passing out to mix with the surrounding water." The first and more powerful of these currents is called endosmose, (flow inwards,) and the second and less powerful, exosmose (flow outwards.) The cause of their motion was by Dutrocet referred to galvanism; but it is now more generally believed to arise from "the attraction exerted between the particles of the different fluids employed as they meet in the porous membrane.

Now the conditions requisite for this action are two fluids of different densities, separated by a septem or partition of a porous character. This we find in the roots. The fluid in their interior is rendered denser than the water around by an admixture of the descending sap; and the spongeole (or spongelet) supplies the place of a partition. Thus then, as long as this difference of density is maintained, the absorption of fluid may continue. But if the rise of the sap is due to the action of endosmose, there ought also to be an exosmose. This is found to take place; for if a plant is grown with its roots in water, the fluid surrounding them is soon found to contain some of the peculiar substances they form, and which are contained in the descending sap; thus a pea or bean would discharge a gummy matter; a poppy would communicate to the water an opiate impregnation, and a spurge would give it an acrid taste.

Thus we see how beautifully and how simply this action, extraordinary as it seems, is accounted for when its whole history is known on principles which operate in other departments of nature.

From this it must appear obvious to every one that, to keep plants in a healthy state, the conditions of endosmose and exosmose must be carefully maintained. Thus in the case of bulbs maturing and at rest, and of plants cut down in the autumn, such as Pelargoniums and Fuchsias, the actions of the leaves being destroyed, the fluid, rising by the force of endosmose must gradually subside, and the plants languish into a state of semi-vitality, till such time as genial warmth shall expand the fluid within their latent buds, and cause them to open and put forth new leaves. This is the reason why the application of water to plants thus circumstanced should be carefully avoided, excepting, indeed, a few special subjects, whose succulency is not sufficient to keep them from being shriveled up.—*Floricultural Cabinet.*

Vegetable Growth.

Any great improvement in the culture of the soil is quite inconceivable without an acquaintance with the substance which really nourishes plants, and with the sources whence such materials are usually derived. It has been supposed that vegetable mould, the product of the decay of other plants, acted upon by water, is thereby rendered capable of being absorbed by their roots. If it be, it must be in some very altered form, for if a portion of good mould be long subjected to the action of water, that fluid will not dissolve more than a hundred thousandth part of its weight, the solution containing also organic matters and the saline constituents of the rain water that has fallen upon the mass subjected to experiment. We must look further for the true explanation of vegetable growth. We have passed through a season of most unparalleled drought. Had water, regarding not simply as the solvent of decayed mould, to be taken up by the roots, but more than this, as directly absorbed by leaves and stems on which it fell from the clouds, been so exclusively necessary for vegetable vitality and growth, it would not have been only half a crop that had been taken from us, but more nearly the whole. Mould can only arise from the decay of plants. No primitive mould can have existed, for plants must have preceded the mould, which this theory assumes as necessary to their existence. Whole tracts of land in the green wilds of the States, and immense woods and forests in all parts of the world, receive

no carbon, or which is the same thing, woody fibre, through the channel of artificial manure; how does it happen then that the soil, instead of being exhausted, through the annual production of vegetation for ages, becomes annually richer in carbon? In other words, a certain quantity of carbon is taken every year from an unmanured forest or meadow in form of growing wood or grasses, and in spite of this the quantity of carbon in the soil augments, it becomes richer in vegetable mould, so that in time the land will not support the trees which stood upon it—they fall and the surface becomes a peat moss, formed as all bogs and mosses have been formed invariably. If plants give back to the soil, as they evidently do, more carbon than they take from it, it is plain that their growth must depend on their reception of carbon as food from some other quarter.

If the soil or artificial additions to it do not produce woody fibre, we are driven to look for it where only it is next naturally and truly to be sought for—the atmosphere. Air contains carbonic acid, it is an accidental ingredient, not chemically one of its compounded and necessary elements. It is poisonous, in even a diluted proportion, to the lungs of all creatures. If the reason of its presence in the atmosphere be not that, by a species of vital chemistry it may become decomposed by the leaves of plants, and thus yield its carbon to plants to form their skeleton, what other use can be assigned for its presence in the air? Besides, the position is susceptible of direct proof.

To animals the carbonic acid of the atmosphere would prove poisonous, only that the proportion of its mixture in the air they breathe is very small, (another wise provision), yet taken into the stomach it is grateful. Then, too, which is the burden of the proof, we know it to be a fact that during the sunshine or daylight, the leaves of all plants are continually absorbing this very gas, on one surface, and giving out oxygen from the other, oxygen and carbon being two chemical elements which go to form carbonic acid. Now if this vital chemistry, this work of decomposition, this absorption of one of these two elements, be not identical with accretion or growth, what other explanation can be given?

Let us relate an experiment:

"Two hundred pounds of earth were dried in an oven, and afterwards put into a large earthen vessel; the vessel was then moistened with soft water, and a willow tree, weighing five pounds, was placed therein. During the space of five years the earth was carefully watered with rain water or pure water. The willow grew and flourished, and to prevent the earth being mixed with fresh earth, or dust blown into the pot, it was covered with a metal plate, perforated with a great number of holes suitable for free admission of pure air. After growing in the earth for five years, the willow tree was removed, and found to weigh one hundred and sixty-nine ponnds and about three ounces. The leaves which fell from the tree every autumn were not included in this weight. The earth was then removed from the vessel, again dried in the oven, and again weighed; it had lost only about two ounces of its original weight. Thus one hundred and sixty-four pounds of lignin or woody fibre, bark, etc., were certainly produced *from the air*.

Thus, then, is the balance kept up; oxygen is certainly removed from the air by combustion, by breathing, by putrefaction. In exchange for this, each acre of land producing eight hundred weight of woody fibre gives annually to the atmosphere about 2,600 pounds of oxygen gas, to replace that which is lost by the above agencies.

Many conditions are necessary for the life of plants, and they require to be most accurately understood in their relation not to *mere life*, but to secure the increased growth, the artificial forcing of such of them as by the art of man are removed from a state of nature. We must remember that wheat, most of the cereal grasses, potatoes, and apples, are (to speak without profanity) not the things that the Deity made them. Each kind required special conditions. If but one of these be wanting, although all the rest be supplied, the object of the cultivator will be defeated.

There must be an adaptation between the intention and the means. The maker of straw bonnets requires strong straw; it will grow only in soil overcharged with flint. The baker wishes for a fat ear of corn, which can only be raised in a soil rich in animal additions. The one kind of help will not indifferently answer for the other. A fowl can not lay eggs without lime for shells; farmers keep poultry, and what is true of a fowl, is true of a cabbage, a turnip, or an ear of wheat. Mix with the food of fowls a sufficient quantity of chalk, and they will lay an increased number of eggs. Let farmers lay such facts as these to heart, they are matters of common observation, and transfer the analogy as they justly may do, to the habits of plants, which are as truly alive, and answer as closely to evil or judicious treatment as do their own horses.—*Post.*

☞ Ohio exports 15,000,000 bushels of wheat annually.

Editor's Bureau.

We offer no apology for the lateness of the issue of this pair of numbers, though a hundred might be offered, any and all of which would be satisfactory to some parties, but quite as unsatisfactory to others: we offer none, however, deeming such things in very bad taste, especially since they never have been known to undo the damage, or to rectify the evil, and we are assured that nothing we can now say, will cause the Review to retrograde in the calendar of months, even though the issues be christened with their proper mensal cognomens. It might be easy to lay the blame upon one or upon another, or to divide the responsibility; but little good would be effected in that way, and now, all that is left is simply to make good our engagements to the readers, and supply the requisite amount of mental fabulum and recreation, and to assure them that another couplet, representing the next ensuing months, those of November and December, are in a state of forwardness, being in the hands of the printers, and we trust they will rapidly follow the present issue, and thus enable subscribers, ere long, to complete the volume for which they have paid.

The long delay, and indeed suspension, of the Review, has been a source of the deepest mortification, and of the greatest annoyance to the editor, who has been assailed repeatedly as a delinquent by his old friends, who felt that they were entitled to better treatment at his hands, knowing, as they did, that in previous years such things did not occur, excepting as trivial detentions arising from unavoidable causes. Bear with us, friends, and forgive: the associate editor had removed to the country, where, immersed in the fascinating pursuit of rural affairs, he was enjoying the charms of sylvan scenes, when he was stricken with a sad attack of disease that crippled his energies for a time, and he could not labor for you. The performance of this work has, therefore, devolved entirely upon myself, and has occurred just at a time when most fully occupied with the regular and onerous duties of my place in the college. It has been impossible to render the continuous and undivided attention to the undertaking of which it is deserving, and indeed which it absolutely requires.

The future is before us, and we shall endeavor to make good use of it. Let us not waste ourselves in vain regrets for the past, and only regard those things as mementos by which we may be guided in future movements, and from which to learn experience.

Notice to Old Friends.

Some months have elapsed since we have had an opportunity of exchanging salutations. This, my good friends, has not been of my seeking—nor have I been able to avoid the detention, during the past year, of the numbers of the periodical over which I am supposed to preside. For the sake of benefitting you, the readers, I surrendered all control of the publication to one whom I supposed to be abundantly qualified to conduct the business much better than I could possibly do, who am not a publisher by profession.

My disappointment and yours needs not to be set forth upon this occasion, which I embrace, for the sake of presenting you the compliments of the season, and also of beging you not to prejudge me of the delinquencies referred to. My good friends, who, for three years, looked to me as the Editor, Publisher and Proprietor, &c., of the Review, do not at all appear to understand the changed relation which I have occupied toward them during the past year, having been simply Editor in chief, without any control over the printing and publishing department.

Very many of those who valued the Review have written to me, almost complainingly, in regard to its having failed to reach them regu-

larly. To all such I can only say, that the work was conducted by myself for three years, without such a failure, even though at the sacrifice of much money annually required to complete the volumes, beside that received from subscribers. Do not blame me now !

In the present troubled state of the financial world, it may be difficult, *without a garantee*, to find a suitable, efficient publisher, even for a work which has already attained a strong hold upon the affections of the people of this country. *East and West, North and South*—such a work is needed. The *Horticultural Review* is unbiased in its views by any selfish ends. It is the exponent of progress in Horticulture and the Rural arts. *Shall we have that guarantee*, my friends ? For the sake of asking this question, I now present myself before you—and upon your replies will, in a great measure, depend the future relations that may exist between you and myself. The field of labor is one that is most agreeable to me, but to occupy it, I must have your liberal and prompt support. Shall it be had ? I do not ask you to send money, either to pay past debts, nor even to carry on the work at this time. Send me your names, and those of your friends, as SUBSCRIBERS, that I may know whether indeed the Review is really wanted by people enough to justify its publication. Let me have a prompt response, and so soon as a sufficient number of names is received, there will be no difficulty in procuring a good publisher. As to the editor, you and he are already acquainted, and you are well aware that no effort will be lacking, on his part, to render the work worthy of your support.

Rally your neighbors, and send me your names in any quantity—singly, in pairs, in dozens, or in hundreds ; and so soon as the list has reached a paying number, I will commence the issue, and your remittances can be made on the receipt of the first number. The cash plan must be adopted as the only correct method of doing business, when the subscriber can feel confidence in the rectitude of the proprietor.

Address, JOHN A. WARDER,
Ed. Horticultural Review.

THE ELEMENTS OF AGRICULTURE—a book for Young Farmers. By Geo. E. Waring, Jr., Consulting Agriculturist. New York : D. Appleton & Co.

This delightful little book has pleased me exceedingly, from its beautiful simplicity and clearness, and yet it is comprehensive, as its title should lead us to expect. Less pretending, as indeed it is less in size than some of the books in this department that have been favorably received by the public, the great perspicuity of this manual accounts for the happy manner in which it has been received everywhere by those best qualified to judge and appreciate its merits. Legislatures and school superintendents have done wisely by introducing it extensively as a text-book, and by placing it, in many of the States, in the District School Libraries. In New York it has been adopted as a text-book, for which its simplicity well adapts the work. It may well be assumed that it contains more valuable available knowledge than some larger and more pretentious volumes. The work is happily introduced into every School Library in the State of Ohio, and will there undoubtedly exert a most happy influence in directing the minds of our country boys to a more exalted view of the art of culture, which indeed should ever be guided by the light of science.

The following is from an eastern paper and an old friend of the author shall be allowed to express his opinion, as from a knowledge of Mr. Waring's book and an acquaintance with himself, I feel willing to indorse it every word :

"There is a directness in his manner of treating his subject, a clearness of statement, and a freedom from redundant words and images quite unusual among the youthful aspirants to literary and scientific distinction. Altogether, the "Elements of Agriculture" give evidence of a maturity of mind which can scarcely be referable to the author's limited experience, and may, therefore, be taken as evidence of superior natural endowments and careful instruction under one of the best masters.

"Mr. Waring's Manual—written before he had completed his twenty-first year—is probably the best work of the kind extant. It is seldom that so youthful a candidate for public favor, in any ambitious walk of life, is so well received, and we may add, that such a recep-

tion is rarely so well deserved. Possessing a fine physical constitution, a musical voice and agreeable manners, with all youth's pure fires unquenched, and the whole period of manhood before him, our author has every opportunity to achieve an enviable and lasting reputation as a scientific lecturer and popular writer."

The New York Tribune, referring to the legislative enactment of Vermont, introducing this work into the Public Schools, says:

"We have so often commended the study of Agricultural Science in Common Schools that we have little new to urge. The idea of using some cheap elementary work like Waring's as a reading book, is perhaps the most feasible of any. Nothing can be more absurd than dragging boys and girls of eight to sixteen years through such essays as make up the bulk of the Englih Reader and most other first-class reading books used in the common schools of our boyhood. The great majority do not really comprehend them, and are little more profited by their perusal than if they were printed in Greek or Latin. But put into their hands reading books that tell them of what elements soils are composed, how those elements with others floating in the atmosphere are combined in plants, how these again reappear in animal structures, and how trees absorb mainly through their leaves the carbon and hydrogen which form so large a proportion of their trunks and limbs, and they cannot fail to be deeply interested as well as instructed. Now they will read to learn, and will be better fitted for intelligent and efficient husbandry at the close of each term. They will leave the common school better fitted for improving the half-exhausted lands they are destined to cultivate than are the graduates of colleges under the old system."

The Advocate, Stamford, Conn., warmly supports the book:

"Vermont has now, however, set aside the limits of conservatism, and stands before the world as the first State in America that has passed a law to encourage the study of agriculture *in the Common Schools*. This is striking at the root of the matter. The interests of her people are almost entirely agricultural.

"We hail this step as one which is calculated to do much toward the promotion of general intelligence in Vermont, and as a precedent which other States will follow, to the great good of the whole country. We know this book and believe it to be peculiarly adapted to the uses here laid out for it. Its author, Mr. Waring, was for a long time our townsman, and we are glad to see his early efforts for the improvement of agriculture thus appreciated by State authorities. While this movement will greatly benefit him in point of position, we think that Vermont has the best of the bargain and will always remember him as a benefactor to her people."

☞ See Prospectus of New Volume on 4th page of cover.

A Splendid Work.

NORTH AMERICAN SYLVA; or a Description of the Forest Trees of the United States, Canada, and Nova Scotia. Illustrated by 156 finely colored Copperplate Engravings. 3 vols. royal octavo. From the French of F. Andre Michaux.

Also, three additional volumes of value and merit. By Thomas Nuttall, Esq.

This beautiful and highly interesting work has recently been reproduced, in Philadelphia, by Robert P. Smith, publisher, No. 15 Minor street. The engravings are from the original plates, and represent the foliage, flowers, and fruits of American trees, in life-like colors and delineations. Michaux, father and son, spent many years in this country, commissioned by the government of France, to enrich that country with North American trees. They traversed this country in every direction, often guided only by the stars and the savages, and explored the treasures of its Sylva, from Hudson's Bay to Florida—from the Canadas to the Mississippi. The present work is one of the results of their immense labor, and its republication in this country can not but afford pleasure to every American interested in the advancement of the arts in the United States.

The three additional volumes by the distinguished botanist, Nuttall, are equal in every respect to those of his illustrious predecessors in the work of immortalizing American forest trees, and the whole set forms an elegant and indispensable addition to the library of the gentleman amateur, either in the city or country—in the former, these volumes give us most refreshing mementos of sylvan shades, that in some degree compensate for the artificial and unwholesome surroundings of brick walls and all unnatural things; but it is in the latter situation, that the gentleman of taste, or the student, such a friend, ever at hand with its store of knowledge, will prove peculiarly valuable. In this elegant work the planter of trees, or the merest admiring amateur may find infinite satisfaction by investigating the features, habits, and characters of trees. What a delightful study, that of trees! and then how

pleasant to individualize the several varieties that in their combined beauty make up the glorious groups of our noble forests.

The American Sylva is a magnificent book, and will do much to encourage that noble feeling, the admiration for trees, that, alas! has appeared to have been too often driven from American minds, at least those who have been obliged to contend with the sturdy native forests.

MORE AGRICULTURAL PAPERS.—From the Ohio Farmer we learn, it would seem that the Hoosiers are not content with three good Agricultural papers in their State. We have before us the first number of the "*Tippecanoe Farmer*," published monthly at Lafayette, Indiana, by A. J. Weaver and John Levering, proprietors and editors. Terms 50 cents a year. It is an octavo of sixteen pages. We fear our friends will find their experiment an expensive one, but for their success they could have none other than our best wishes.

The Kentucky Farmer.—The Prospectus of a paper, with the foregoing title, has just been issued by Messrs. Stanton & Marshall, of Maysville, Ky. It is to be published semi-monthly at $1 50, and clubs of forty for $40. The first number will appear in January, provided 1,000 subscribers are obtained by that time; no editor has yet been selected for it. Kentucky needs a good agricultural and stock paper, and perhaps S. & M. will give it to them. But this can not be done with less than 5,000 subscribers. The editorial labor and other incidental expenses absolutely required to make such a journal of any real value to those who are expected to patronize it, are twenty-fold greater than that which is usually expended on ordinary newspapers. Agricultural publications especially, need as their conductors, men of wide experience, varied talent, tact, taste, and energy; such can not be had without *money*, and money can not be had without *subscribers*. The Literature that belongs to Farming has heretofore, with a few grand exceptions, been unreliable, trashy, and worthless. That it will grow better and better, we have abundant reasons for believing. All who can write, therefore, or even put a fact of importance on paper, should feel bound to contribute to the Agricultural press to the utmost of their ability. Let the Kentuckians, then, sustain their paper with purse and brain, for without both it will be worse than a failure.

OBITUARIES.

General Adoniram Chandler, late Corresponding Secretary and Agent of the American Institute, died on the 16th of October, aged 62 years. This gentleman has long been a prominent and useful member of our community. During the war of 1812 he went to the lines and offered himself as a volunteer—was at the battle of Queenstown, and signalized himself in that and other engagements during the war. He has at different times been President of the Mechanics' Society, and Director in the Mechanics' Bank, and several other public institutions—was a member of the Assembly of the State of New York, and for many years Commissary General of the State. From the first formation of the American Institute, he has been one of its most active members, and was for a long time Vice President of the Institution. Gen. Chandler has left a large circle of friends to mourn his loss, and to admit his past usefulness. It will be remembered that one of his sons was killed in Mexico, while acting as a Lieutenant under Gen. Scott, since which time the health of Gen. Chandler has gradually declined.

The Reports of the American Institute, published by the Legislature of the State for the last two years, give evidence of his untiring zeal as Corresponding Secretary, and these Reports will long be acknowledged as useful books of reference to all matters connected with American progression.

It is with the most painful emotions that we record the death of our late friend Charles Enderlin, M. D. Dr. Enderlin came to this country in 1850, and during his sojourn in New York he enjoyed the confidence, respect and admiration of a large circle of scientific friends. He was born on the 16th of April, 1813, studied Pharmacy in Heidelburgh under Geiger, Medicine in Heidelburgh and Wurtzburgh, and Chemistry in Geissen, under Leibeg, with whom he has maintained an active correspondence, and in whose journal he has largely contributed.

Many of the organic analyses by Dr. Enderlin, including the analyses of blood, bile, etc., are standards for reference, while peculiar powers as a chemical instructor, will long be remembered by his pupils of the last three years.

During our acquaintance with Dr. Enderlin, he has analyzed for us many hundred soils, and in no case have we ever had the slightest cause to suspect their want of accuracy. He was the first to discover the presence of phosphates in the green-sand marls of New Jersey, and thus to solve the riddle of the true cause why these marls were so valuable as manures. His papers in reply to Prof. Porter and others who chose to attack him and us, will long be remembered by those gentlemen and the public.—*Working Farmer.*

HORTICULTURE AND POMOLOGY.

Washingtonia Gigantea—Mammoth Trees.

Sacramento, California,
October 30*th*, 1854.

DR. WARDER, EDITOR HORTICULTURAL REVIEW:

SIR: Thinking it would be desirable to you and a portion of your readers to get a description of the largest trees that have been revealed to modern discovery, and which are attracting the attention of Botanists and scientific men all over the world, I have thought of giving you my ideas of them from personal observation. I had never conceived of the capacity of vegetable forms attaining such enormous dimensions. The "Big Trees," or Mammoth Tree Grove, as it is called here, contains eighty-five monster trees in an area of less than 100 acres. They are situated on the Sierra Nevada, in Calaveras county, between the head waters of the San Antonio and Stanislaus Rivers. They exist in no other region of the Sierra Nevada, nor any other mountain range of the earth—there is not even a tree of its kind to be found out of the area above mentioned. It is a coniferous tree, of an entirely "*new genus*," having a foliage resembling a red cedar or juniper and the *cones* of a pine. The bark is of a pale cinnamon brown color, twelve to fifteen inches in thickness, very much like the bark on a large Arbor Vitæ; the wood when green is very heavy and solid, when dry light, soft, and of a reddish color, resembling very much the wood of the red cedar. The *cone* is small and compact, and about the size and form of a hen's egg; the seeds, when taken from the cone, resemble very much parsnip seed.

The branchlets look short, and the head of the tree is small in proportion to the size and height of the trunk. The trees generally average over 300 feet in height, and 90 feet in circumference at the base; the largest perfect tree standing is 91 feet in circumference at the base, and 327 feet high. Its proportions are as symmetrical, clean, and straight, as a white pine, and as you walk around and look up into it towering over 300 feet into the sky its magnitude absolutely oppresses the mind with awe. But the greatest wonder of all is one prostrate giant, that has evidently been blown down hundreds of years, and is decidedly and undoubtedly the largest tree in the world—it measures 110 feet in circumference at the base, and 12 feet in diameter, and 300 feet from its roots; it must have been, when standing, 450 feet in height. I walked through its decaying and hollow trunk 250 feet. There is another prostrate tree which is hollow for 60 feet, into which a person can ride on horse-back, without stooping, for that distance. This tree is 97 feet in circumference and 330 feet high.

The stump of the tree cut down last year is covered by a house, and forms a floor of sufficient dimensions to accommodate forty couples in a cotillion. A portion of its prostrate trunk is used for a bowling alley. It required five men twenty-five days to overthrow this tree, which was done by boring with large pump augers. Its immense size and weight when it fell, convulsed the earth, and forced the soil from beneath it so that mud and stones were driven a hundred feet high.

The estimated amount of timber in those trees is over 300 cords, and from counting the concentric rings, they are over 3000 years old; they are supposed to grow about two inches in diameter in twenty years. I will here add a few beautiful sentiments from the pen of Dr. C. F. Winslow reflecting on the age of those trees, etc. "What changes have transpired in the condition of people and of States since the germ shot down the roots of those trees. The golden age had not yet dawned on the Roman empire, and the ancestors of the present polished races of *Great Britain*, *France*, and *Germany* were naked and wandering savages, in the bleak and snowy forests of Northern Europe. Within this time the man of Nazareth and the prophet of Mec-

ca have overturned the dogmas and idolatrous worship of the benighted nations of Asia and Europe, and like the waves of the ocean, little and great kingdoms have arisen, and melting away, mingled their elements with each other, until no trace exists of their former bounds or grandeur. How strangely interesting are all these multitudinous events when crowded by contrast into a space of time occupied by the growth and life of a single tree on these Alpine and lonely heights. If the lifetime of a single vegetable germ shall outlast and look down on all these strifes and transitions of the races of man for three thousand years, are we not compelled to bow down and acknowledge the utter nothingness of mortal man and the infinite greatness of the power that hovers around the globe and weaves a germ from the dust of the earth that shall outlast sixty human generations." Now, for a name to the new tree, some have supposed it to be a Taxodium, but I am perfectly confident it is not, and is without question or doubt, a new genus. Mr. Lobb, an English collector, sent seeds and specimens to London in 1851 to Dr. Lindley, who immediately discovered it to be a new genus, and applied to it the name of Wellingtonia Gigantea. Lobb was not the original discoverer but an American, by the name of Dolle, who discovered the trees in 1849. American Botanists very properly and justly question the right of Dr. Lindley to apply the name of a British hero to this new and remarkable tree discovered by Dolle, and indigenous to the country of the immortal Washington. Let this gigantic and wonderful new genus be forever known in all botanical books as the Washingtonia Californica; and let the seeds and plants be disseminated all over America and the world by that honored name, and the scientific men of all nations will acknowledge and ratify the justness of the claim, notwithstanding the botanical eminence of Dr. Lindley, or the meritorious distinction of his hero Wellington.

The whole range of the Sierra Nevada is covered with dense forests of the various species of conifera. It is almost impossible to conceive anything so grand and magnificent in the vegetable kingdom as the coniferous forests of the Sierra Nevada. I was particularly struck with some species. Pinus Lambertiana is one of the noblest in this towering wilderness of coniferas, averaging eight feet in diameter, and over 200 feet high. The cones are from twelve to fifteen inches long, and contain nuts about the size of Lima beans, the kernels of which are equal to filberts, and are eagerly sought by the Indians, who collect them in great quantities for food. The Arbor Vitæ grows to an enormous size—one hundred and fifty to two hundred feet high, and six to eight feet in diameter. Likewise the Balsam Fir is often six to eight feet through, and two hundred feet high. They are all perfect and symmetrical in form, and are well worth a trip alone from the Atlantic States to be seen. The Taxodium Sempervirens or Red Wood, is one of the grandest of the California Conifera, and is exclusively confined to the coast range of mountains, none of them being found on the Sierra Navada. It was this tree that the unfortunate Douglas was so particularly struck with when he was in California. He says: "The great beauty of California vegetation is a species of Taxodium, which gives the mountains a most peculiar, I was almost going to say awful appearance. I have measured specimens 270 to 300 feet high, and 32 feet round, three feet from the ground." There have been some trees discovered, since Douglas' time, of the Taxodium larger than those he saw. There is one at Humboldt Bay that is 28 feet in diameter, and over 309 feet high, and was supposed to be the largest tree in the world until the Washingtonias were discovered.

You will be happy to hear that this young State is rapidly advancing in agriculture and horticulture. In five years it will be the greatest fruit-producing State in the Union; and in that time, in my opinion, fruit will be cheaper here than in any of the old States. It is, without doubt, the best country in the world for the cultivation of the grape vine of all kinds, and is bound to become, in time, the greatest wine-producing country in the world; the grape here is subject to none of the diseases

common with you. To give you some idea of the success of its cultivation in California I have observed, in the Pomological Garden and Nurseries of A. P. Smith, of Sacramento, Black Hamburgh, Royal Muscadine, Chaselas de Fontainbleau, and Muscat of Alexandria, as well ripened, as good a crop, and as fine bunches as ever I saw them, have grown under glass. They were trained on trellises in the open ground the same as you grow and train your catawbas. Some bunches of Black Hamburgh weighed four pounds, and were as large and fine as any I had ever seen. Mr. Smith is a very successful cultivator; he irrigates his whole grounds with water, raised from the American River, by a powerful steam engine. The growth of his fruit trees, for the time they have been planted, are truly astonishing.

Mr. Smith pointed out to me twelve peach trees that had borne fruit this year for the first time. They were all of the finest budded varieties; the fruit from the twelve trees brought him *twenty two hundred dollars;* the most of the peaches sold for one dollar each. Those prices will never occur again, as there will be thousands of the fine budded varieties in bearing another year all over the country. I saw here a splendid crop of Hovey's Seedling Strawberries in the latter end of October, the fruit as large and fine and as well flavored as with you in May. The way he obtained them is thus: After the beds have produced their crop of fruit in May, the dry season sets in; he then allows the bed three or four months rest without watering. At the end of that time he commences irrigating them freely; they then begin to grow beautifully as in spring, and the result is, a fine crop of fruit in October and November.

This is the greatest country in the world for producing all kinds of Agricultural produce. You have, doubtless, heard of the immense yield of wheat, barley, potatoes, onions, and turnips to the acre, and of the great size to which the three latter sometimes grow. The finest market vegetables I have ever seen in my life are here—finer than any I ever saw in Convent Garden Market, London. A glorious future awaits this young State, when once Society becomes properly regulated, and a railroad communication is established, connecting the Atlantic States with the Pacific, which time and American perseverance is sure to accomplish.

Yours Respectfully,

ROBERT CARMICHAEL.

I enclose a few seeds of the Washingtonia Californica.

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The name that has been applied to this tree by Prof. Lindley, an English botanist, is Wellingtonia Gigantea. By him it is declared to be so much unlike other conifera as not only to be a new species, but to require description as a new genus. Other botanists, of eminence, think differently. To this, however, he has seen fit to apply the name of an English hero, a step indicating as much personal arrogance or weakness as scientific indelicacy; for it must have been a prominent idea in the mind of that person that American Naturalists would regard with surprise and reluctance the application of a British name, however meritoriously honored, when a name so worthy of immortal honor and renown as that of WASHINGTON would strike the mind of the world as far more suitable to the most gigantic and remarkable vegetable wonder, indigenous to a country, where his name is the most distinguished ornament. As he and his generation declared themselves independent of all English rule and political dictation, so American Naturalists must, in this case, express their respectful dissent from all British scientific "stamp acts."

If the "Big Tree" be a Taxodium, let it be called now and forever *Taxodium Washingtonium.* If it should be properly ranked as a new genus, then let it be called to the end of time, *Washingtonia Californica.* The general name indicates unparalleled greatness and grandeur; its specific name, the only locality in the world where it is found. No names can be more appropriate and if it be in accordance with the views of American botonists, I trust the scientific honor of our country may be vindicated from foreign indelicacy by boldly discarding the name now applied to it, and by affixing to it that of the immortal man whose memory we all love and honor, and teach our children to adore. Before many ages shall elapse the ruthless hand of man, or climatic changes, may totally annihilate the few giants of this remarkable race, now growing on and confined to this small basin in the Sierra Navada. Seeds, indeed, may be

planted, and means employed to prolong its existence elsewhere, but few spots of earth, perhaps none, will be eligible for its natural and complete development as its present locality. Under any and all circumstances, however, whether of perpetuity or extinction, the name of Wellington should be discarded, and that of WASHINGTON attached to it, and transmitted to the schools of future ages.—*Dr. C. F. Winslow.*

Ohio State Pomological Society.

SIXTH SESSION.

The Society met in pursuance of the call of its officers, in the hall of the Columbus Horticultural Society, on Tuesday, December 5th, 1854, at 9 o'clock, A. M., and was called to order by the President, A. H. ERNST, of Cincinnati, and DR. J. A. WARDER, Vice President. In the absence of F. R. ELLIOTT, Esq., Secretary, A. B. BUTTLES, Esq., of Columbus, was appointed Secretary, *pro tem*.

The President upon taking the chair called the attention of the Society to the objects of this meeting as set forth in the circular, stating that although the season had not been very favorable for fruits, the display upon the tables before them gave evidence that the care and skill of the cultivator had not been unrewarded.

He was happy to meet so many of his Pomological brethren with such fine specimens of fruits, giving encouraging evidence of the growing interest in the noble work in which this Society have interested themselves, and he hoped that the good work begun, would be continued until every good fruit should be brought to notice to the exclusion of so much poor trash as is still cultivated in most sections of our State.

A number of other gentlemen were in attendance and participated.

On motion, the President appointed the following business committee: Dr. J. A. Warder, M. B. Bateham, and James Edgerton, who presently made the following report as to the order of business:

The Business Committee report, that it would be advisable to devote the evening sessions to the discussion of the topics suggested in the circular; and that the topic for Tuesday evening be the influence of the stock on the health and duration of the varieties grafted or budded on the same, and the respective merits of the two modes for propagation, and the relative effect of root grafting and stock-grafting on the health and duration of the tree.

It is further suggested that the election for permanent officers be held on Wednesday morning, at 9 o'clock.

The fruit discussions shall be held during the day time—morning and afternoon sessions, and the fruits shall be brought up in the following order: New varieties be first considered, then those with which the members are more familiar, and especially such as the committee think, have not been sufficiently noticed at former meetings. Adopted.

The following committee were appointed to nominate officers: W. B. Lipsey, Maj. Millikin, and A. B. Buttles.

On motion, A. H. Ernst, M. B. Bateham, and Dr. Warder were appointed committee on Synonyms, to report upon the correct nomenclature of the fruits exhibited.

EXAMINATION OF FRUITS,

AS PRESENTED BY THE COMMITTEE.

House Apple, from Mr. Peticolas.—Medium size, round, slightly conical, color dullish red, with streaks.

Dr. Warder considered it an apple of long keeping, but unworthy of cultivation. Coincided in by Mr. Kelly and others.

WEAVER'S RED WINTER.—Round, slightly conical, dull red, flesh spongy and tough, flavor not agreeable—unworthy of cultivation.

VIRGINIA GREENING.—Somewhat similar in shape and color to Rhode Island Greening—not quite so flat—long keeping, but valueless.

SMALL BLACK, from Mr. Peticolas.—Similar in color and shape to New Jersey Black, but not so large. Generally considered of inferior quality, though unknown to the members.

DOMINIE, from A. R. Whitney, Franklin Grove.—Medium size, round and flat, yellow with stripes of red. Specimen immature. Dr. Warder stated the apple in Illi-

nois to be of vigorous growth, bearing the third year fruits, like strings of onions, following the Rambo in season. Mr. John D. Clark, of Somerset, concurred.

WILLOW LEAF, from R. Buchanan, not the "Willow Twig."—Medium size to large, round, flattened at the ends, yellow ground colored, with light red, mottled and striped.

Mr. Kelly esteemed it for its beauty and long keeping quality—found by Mr. Buchanan to be an unfailing bearer. Flavor inferior.

Dr. Warder considered the fruit of no value as a table apple, though agreeing with Mr. Kelly as to its beauty and bearing qualities, and for cooking. Opinion generally concurred in by the Society.

LIBERTY, from Mr. Holt, Franklin county.—Medium size, slightly conical, dark red on yellow ground. Mr. Holt stated it to be a very hardy apple, keeping till June—originated in Liberty, Delaware county. Generally considered by the Society, on account of its long keeping quality, as well worthy of trial. Mr. Bateham had seen it in Columbus market not later than May—it sells well, but he considered it only a second rate apple. Mr. Thompson, of Delaware, had seen the apple in market late in the spring, and considered it of first rate quality.

FINK'S SEEDLING, from Mr. Clark, of Somerset, Perry county.—Originated on the farm of Mr. Joseph Fink, near Somerset, Ohio. Original tree is in an orchard of seedlings, among which are several others nearly resembling this in appearance and quality. Was first brought into notice by the late W. I. Clark, nurseryman, of Somerset, about seven years ago. See report of first session of this Society, page 28.

Small, round and flattish, very smooth, greenish yellow, with a dash of brown red, flavor mild, sub-acid; was awarded the first premium on seedling apples at the late Ohio State Fair. It is a remarkably long keeper—the fruit of two seasons' growth often having been shown at the same time. Was exhibited at former meetings of this Society, and pronounced *Tewksbury Winter Blush*; but this was afterwards found to be incorrect, and its claim to be a seedling admitted.

Mr. Bateham considered it in quality not over second rate; but highly valuable for its long keeping, especially for market. Mr. Clark stated that it was very highly esteemed in the neighborhood where it originated. The old tree has borne forty bushels picked fruit in one season; regular and annual bearer. Col. Millikin and Mr. Steele did not consider it in quality of much value. Gen. Worthington did not consider the fruit at this time in a condition to be properly decided upon—it might turn out a first rate apple.

Mr. Clark stated the season to be in April, May and June; and far better than the Romanite, and as good as Rawle's Janet in its season. Mr. Bateham said that he considered it the best apple in June that he had seen raised in Ohio.

The Society adopted the name of "FINK" for the apple, and recommended a full trial—it not having been fairly tested, save in certain localities.

DECEMBER RUSSET, from W. B. Lipsey.—Medium size, oblong square at the ends, greenish yellow ground covered with russet and mottled red and bronze, flesh white and tough.

Mr. Lipsey stated it to be a better bearer than the Roxbury. The fruit was brought from New Jersey to Knox county; trees thrifty, upright and good growers; fruit keeps till April and May. Considered by the Society as too immature for correct expression of opinion.

"LATE CHANDLER," from Mr. Buchanan—Small, round, flat stem, and tapering towards the eye, dark red. Dr. Warder stated that it had been cultivated about Cincinnati as the Chandler, but knowing it not to be that, it had been called the *Late Chandler*; he could not recommend it, except for its keeping qualities. Generally considered as unworthy of further notice.

WARD, from Mr. Harr.—Very large, oblong, flattened at the ends, yellow, streaked and spotted with mottled pale red, flesh yellowish white, flavor sub-acid, very showy and handsome. Mr. Harr stated that the seed was brought from Virginia to Cham-

paign county, by Mr. George Ward, and grown by him; it is a good bearer and a healthy tree; considered it very valuable for market and a good cooking apple. Dr. Warder called it a fairish good apple, with a banana flavor, never to be forgotten; generally considered worthy of trial.

Mr. Humrickhouse believed the apple was cultivated on the Muskingum.

SWEET PEARMAIN, from Mr. Benedict.—Large, conical, flattened at the base, yellowish green, covered with grey specks. flesh yellowish white, tender and sweet.

Mr. Benedict obtained it from Knox county, where it is highly esteemed; said to bear well. Gen. Millikin considered it as of peculiar flavor, more of the horehound than anything else. Not generally approved.

PINE, from Mr. Benedict.—Medium size, flattish, conical, color greenish yellow with a brownish blush, russeted about eye and stem, and having distinct specks, flesh whitish, resembling the Seeknofurther.

Mr. Benedict obtained it from Mr. Myers, of Richland county, under the name of *Pine;* considered it every way equal to the Westfield Seeknofurther, about the same size, a longer keeper and a better bearer, as well as more certain and uniform. The general opinion was that it was inferior to the Seeknofurther in quality. Dr. Warder considered it superior, though he would not cultivate either for his own table.

TIFF'S SWEETING.—Mr. Benedict considered it the richest sweet apple that he cultivated, though not a good bearer; not generally known.

BUTTER (OF MYERS.)—Medium size, dull red on yellow ground with darker streaks, flesh white, sweet and tender.

Mr. Benedict called it a superior apple for culinary purposes.

Mr. Steele said that this was not the Butter of Dayton, which is large and yellow.

Mr. Ernst considered it a delicate fruit worthy of attention.

Mr. Humrickhouse remarked that it soon becomes dry and mealy and does not keep longer than the middle of December.

SWEET VANDERVERE, from Mr. Benedict.—Society concurred in the opinion heretofore expressed, that it was a good apple. Another apple under same name was presented by Mr. Edgerton, sweet but less juicy.

BETHLEHEMITE.—Sustained the favorable opinion expressed at former meetings.

ROBINSON.—Large dull red, with dark red stripes on pale yellow ground, flat, sweet, tender, juicy and good.

The opinion was expressed by Mr. Ernst, Mr. Benedict, and others, that it was a fine apple. Mr. Kelly did not consider it worthy of introduction, there being so many others superior in its season.

MAY (OF MYERS.)—Large, oblong, slightly conical, brownish red on yellowish green, superficial grey spots, russety about stem, basin shallow, plaited; flesh white, crisp, long-keeper, good in June, good bearer.

Mr. Benedict considers it the best apple of its season; convention consider it worthy of trial.

WINTER SWEET.—Unworthy of further notice.

SWAAR, from Mr. Benedict.—Considered correct, although lighter, larger and more yellow than in New York, but not of so high flavor. Its correctness was doubted by some.

Straggling grower in nurseries and orchard, cultivated near Lithopolis, Fairfield county, and sold well in Columbus market. Mr. Benedict esteemed it highly as an early winter fruit; good market variety owing to its color.

RARITAN SWEET, from Mr. Benedict, who considers it a good bearer and excellent apple, but it falls early; sustains its former reputation as to quality.

MILAM OF BLAIR, presented by Mr. Bateham.—Gen. Worthington said it is a regular bearer and very sound apple, originated near Chillicothe, on the Thomas farm, and known as Thomas apple; escapes ravages of insects, and is remarkable for being uninjured by rough treatment, can be shaken down and shoveled up and will not rot.

Mr. Lipsey does not cultivate it because it falls so much from the tree. Not of the best quality but valuable. [Too little cha-

racter, and that little is all lost by cooking.]

Black Apple—*Jersey Black.*—Mr. Kelly considers it not more than second rate in quality. Mr. Ernst of same opinion.

Gen. Millikin has been acquainted with it for thirty years; considers it the best kind of market fruit; has fifty trees, and would rather increase than diminish the quantity; firm, crisp, juicy, and nearly as good as Newtown Pippin. Dr. Warder concurred in the opinion of Gen. Millikin, and thinks it must supply the place of Esopus Spitzenberg in some sections of the country where it is really a better fruit for any purpose, especially the southern and central parts of this State and Indiana.

Rawle's Janet, or Genneting.—Gen. Worthington had known it for thirty years; an over-bearer, long-keeper, firm and juicy to the last, only second in soundness to the Milam. This opinion was generally concurred in, its only fault being its tendency to over-bearing. Dr. Warder had seen it in perfection in the northern part of Illinois and Indiana. Especially valuable for its late blossoming. The high opinion heretofore expressed was fully sustained.

Mr. Imlay, of Zanesville, presented an apple unknown to him, resembling Kaighn's Spitzenberg, and supposed by the Society to be identical.

Daniel Apple, presented by Mr. Imlay as a new variety in these parts. Dr. Warder thought it an exceedingly tender fruit—too much so for market. Mr. Imlay considered it a good apple; it was cultivated extensively in Allegheny county, Pa., and is highly popular there. Mr. Bateham considered it a delicate and tender apple, but of indifferent flavor.

Mr. Imlay also presented an apple which he called the White Pippin, which was incorrect.

Winter Greening, an apple unknown to the Society. Mr. Imlay called it a first rate apple, in season in March and April, and comparing favorably with Newtown Pippin. Considered much inferior to Rhode Island Greening, and not recommended.

Another apple from Mr. Sigler, of Morgan county, of same name, but different, and much resembling Rhode Island Greening, was presented.

An apple from Mr. Imlay, presented by him as the Winter Pearmain, and not correct, was deemed unworthy of cultivation.

Lop-Side Gray House, Hoop, Black Vandervere.—An apple, bearing these names, was brought from different sources, decided to be correctly the Bl'k Vandervere.

White Rambo,—Noticed on 11th page of last report; but not considered as quite sustaining its former reputation.

French Pippin, from Mr. Benedict.—Doubtful as to its correctness, but a fair, juicy, and high flavored apple. Mr. Lipsey introduced one, dissimilar and inferior, also supposed to be incorrect. The White Pippin, a much superior apple, is also sometimes incorrectly known as the French Pippin. [These apples are well known in the Wharton collection as French Pippin; also about Philadelphia as Dumpling; very fine for cooking.]

AFTERNOON SESSION.

The Treasurer made his report, which was received and placed upon file.

Morgan Sweet, from A. Reese, of Franklin county.—Round, slightly conical, flattened at the base; yellow ground, covered with deep red, and numerous light specks; resembling the Canada Red externally.

Mr. J. S. Goff stated that he had known the apple in Monongahela county, Va., where it was supposed to be a seedling, and was largely cultivated and popular; a good keeper, and good cooking apple, better than most sweet apples. Flavor mild, sweet, not high or first rate.

Scarlet Sweeting, from Mr. Sigler, of McConnelsville.—Medium, oblate, slightly conical, yellowish white, more or less striped with beautiful scarlet; flesh tender, very mildly sub-acid. Not decidedly sweet, generally considered as sub-acid in flavor, and a very good and very handsome apple; said to be a seedling. Mr. Bateham considered the name appropriate—it not being a sweet apple.

Sigler's Pound.—Very large; flattened, green, becoming yellow at maturity; flesh crisp, whitish, juicy, sprightly sub-acid, and

has been kept until July in a sound condition. Though a large apple, it is said to hang well on the tree. The Society recommend it for trial.

Sweet Rambo, from Mr. Sigler.—Considered unworthy of attention.

Sweet Winter Pennock.—Large, round, flattened at ends, slightly conical; light red on yellow ground, flesh white, tender and very sweet. Mr. Edgerton stated that he only knew of its being grown in his neighborhood; supposed to be a seedling. Where known it is esteemed; bears moderate crops. Recommended for trial.

A sweet apple, without name, from Mr. Cherry, of Zanesville; much esteemed in the neighborhood as a baking apple, and brings extra price in Zanesville as such. Medium to large, flat at base, and slightly conical, greenish yellow, covered with russety specks, flesh whitish, yellow, tender and very sweet. Recommended for trial.

Peck's Pleasant.—generally esteemed as a first rate apple, and recommended for trial. Mr. Bateham called it a very fair and handsome apple, not quite first rate. Dr. I. G. Jones considered it as a first rate apple in every respect, having fruited it here for three years. [Known to very few of the members.]

Newtown Spitzenberg.—Mr. Steele stated that it was very extensively cultivated about Dayton, where it was uniformly considered among the best of apples. Tree a good grower, bears moderate and certain crops. [This is the *Vandervere* of Downing, Barry, and others, The Ox-Eye, and Jo. Berry of Cincinnati market, and is undoubtedly the Newtown Spitzenberg of Cox, and has been identified by a member of his family as such.]

Dr. Warder believed it to be the best winter apple tested by the Society. Members were unanimous in recommending it for cultivation, as among the very best of apples, for its season, from November to February.

Gate or Belmont.—A very popular apple in Northern Ohio. With Mr. Ernst it continued to rot upon the tree; on other trees in the vicinity of Cincinnati it was large and somewhat course. In the vicinity of Columbus, it grows large and handsome, but does not keep well.

Pryors Red.—Dr. Humrickhouse esteemed it a very good apple; productive, but very variable in color and shape, according to the soils, being a green russet, deep russet, or deep bronzy red. Recommended by the Society as a first rate apple for cultivation, especially at the south. An upright but not a strong grower.

A LIST OF PEARS,

RECOMMENDED FOR GENERAL CULTIVATION OR TRIAL IN OHIO.

Madeleine.—Dr. Jones—is the earliest pear here, and the best and only good one of its season. Dr. Warder—Grows well on both Quince and Pear. Mr. Ernst—It is a fine grower, handsome, uniform bearer, a little too acid for my taste, but can not be superseded. Recommended for general cultivation.

Dearborn's Seedling. Dr. Jones has fruited it a season or two; an early and abundant bearer; hardy tree; one at seven years bears well. Dr. Warder—so far as I know, think well of it; but do not know enough to speak decidedly; have tasted it; first rate. All agreed that so far as it has been tried, it is first rate. Recommended for further trial.

Julienne.—Dr. Warder considered it equal to Doyenne or Butter Pear, and it comes a month earlier; should be house ripened, and if gathered at its proper time and house ripened, it is first rate. Mr. Miller said his earliest recollection of good Pears, is associated with Julienne. If he did not know at the time, would think it the Butter Pear; esteemed it highly; it is a straggly grower; does not succeed well with him on quince; bears in two or three years on its own stock, abundantly. Mr. Ernst considers the Julienne about the very best of our summer Pears; it is a uniform bearer and good size; larger than Bloodgood and Dearborn; should be taken from the tree before yellow, and house-ripened, to get it in its best quality. Recommended for general cultivation.

Bartlett.—The most popular of summer Pears. Mr. Miller did not think it grew

well on Quince. Mr. Kelly thought that there was no Pear that did better on the Quince, in good soil and warm climates. He had grown it in nursery six feet in one season. Agreed with by Mr. Ernst and Dr. Warder. Mr. Humrickhouse thought it good both as a standard and upon the Quince. Dr. Warder said it could be grafted and do well upon the apple. Unanimously recommended both on Quince and standard.

ONONDAGA.—Mr. Bateham—Excellent about Rochester, where it was first brought into notice; fine in appearance; well recommended; should be extensively cultivated. Has seen a young tree there with a full barrel of Pears on it. Mr. Ernst has fruited it; considers it very fine; has seen it from New York, when it was thought to be Bartlett.

Mr. Stewart has raised it two or three years on small trees; very large? year before last 12 inches in circumference. Mr. Blake spoke well of it. Recommended for general trial in the State.

FLEMISH BEAUTY.—Recommended for its beauty and size and rapid growth as a market variety.

WHITE DOYENNE.—Mr. Kelly recommended it; had never seen it cracked, except from one place; tree a good grower, though he did not think it did well on some soils; a handsome, good Pear, doing equally well as standard and on Quince. Mr. Miller—Had never seen it but where it did well; extensively cultivated in his neighborhood, and very popular; ripening tolerably well on the tree; grows stronger than the Bartlett. Mr. Stewart said it was cultivated in the neighborhood of Columbus, and did well; kept well, and did not crack; believed it did very much better when picked before ripening. Mr. Ernst said it had been a favorite with him; at first it did remarkably well, then began to crack badly, and be perfectly worthless for several years, but for the last two years have produced fair, handsome fruit, as before; this without any special manure.

Mr. Stewart had a pear called *Brown Beurre*, in bearing on which the fruit was hard and cracked badly; he applied sulphur over tree and fruit, and believed that had prevented the fruit from cracking. Mr. Ernst had tried a similar remedy without any benefit; he considered this disease as arising from atmospheric causes.

Mr. Bateham said it had not done well with him in two years' experience, on a moist clay soil, being badly specked and cracked. Mr. Miller said he sold more of this tree than all the others put together. Mr. Edgerton had seen it grown in his neighborhood, and it did remarkably well; the soil a rich clay; also doing well on a thin gravelly hill side. Recommended unanimously for both Quince and standard.

SECKEL.—Mr. Kelly thought it did as well on Quince as a standard. Dr. Warder thought it had made as much wood with him on Quince as almost any one of 50 varieties planted at the same time and similarly treated.

Mr. Ernst, with his limited experience, found it to do well on the Quince—the fruit being finer and fairer. Mr. Stewart thought it fine, but a poor keeper, and preferred other pears. It is a sound tree, and fruit ripens well upon it, but rots badly!

Mr. Bateham had tried it frequently, and could not make it thrive well on the Quince. Mr. Miller knew it to be a hardy tree, and ripening its fruit well on the tree. Unanimously recommended both on Quince and as a standard—especially the latter.

LOUISE BONNE DE JERSEY.—Mr. Ernst thought too much could not be said in its favor. Mr. Humrickhouse thought it, from the specimens he had seen, among the best Pears. Mr. Kelly said it did equally well both on Quince and standard; have had it bearing in one year from the bud; not equal in flavor to some others. Dr. Warder believed it much more handsome on Quince than on Pear; a very good Pear, but scarcely more than second rate in flavor. Mr. Miller—the trees have grown very well on Quince, but do not consider it as first rate. Mr. Stewart—acquainted with it some years; of thirty trees planted eight years ago at the same time, it was first in bearing, and had horne every year but one since; not equal in flavor, but the best bearer and best market Pear grown here.

Mr. Ernst—Had fruited it on imported trees from France for ten years; a good bearer, but variable in quality. Mr. Bateham said it did well with him—growing finely and bearing remarkably, but not first rate in flavor. Recommended especially as a market fruit and for strong soils.

STEVENS' GENESEE.—Mr. Bateham had grown a few specimens here which did well; about Rochester, it was excellent, large, handsome, and good. Mr. Stewart preferred its flavor to that of any other Pear; did well in this county; a tolerably good bearer. Mr. Humrickhouse said that he had eaten it as grown in Coshockton county, and that he had never eaten a better Pear. Mr. Kelly thought it one among the best. Mr. Ernst—The tree is a fine, upright grower, the fruit large and fine, but had proved not very productive with him. The trees are somewhat spreading in their heads, though good growers.

BELLE LUCRATIVE.—Recommended for general trial.

BUERRE DIEL.—Mr. Stewart Cultivated it on Quince, and knows it on Pear; thinks well of it. Mr. Blake also thinks well of it on Pear and Quince; bears better than Bartlett, and would cultivate it after three or four varieties; not quite equal to some others in fine quality. Dr. Warder thinks it a hardy tree, a good Pear; but not equal to some of the first quality. Mr. Bateham has fruited it, but not successfully. Dr. Jones the same. Mr. Miller had his nursery trees of Buerre Diel killed by the snow in the severe winter of 1851.

Mr. Ernst first obtained it on Quince from France, and has set grafts on Quince and Pear, and both fruited. It is not so large on Quince, but holds on well; on Pear it grows larger, but does not hold on so well. I find it a good fruit, not first rate, and would not be without it. Recommended for general cultivation.

LAWRENCE.—Early Winter. Mr. Ernst—When first brought into notice, got grafts from Downing & Wilder; great and early bearer; fruit of good size, fine yellow color, and sweetish fine flavor; retains its fine juicy quality, and does not shrivel in ripening until Christmas; grown on Pear by me. I would recommend it to one asking my advice as a cultivator, who wished a Pear for himself to keep till Christmas, before any other I cultivate. Mr. Kelly cultivates it on Quince; thinks highly of it. Recommended.

WINTER NELLS.—Recommended for general cultivation.

GLOUT MORCEAU.—Early Winter; good bearer; stubby, hardy grower; trees never killed by frost. Mr. Bateham did not think it a good bearer, at least while young; tree grows well; fruit scarce but first rate. Recommended for trial.

EASTER BEURRE.—Recommended for general trial.

LIST OF PEACHES,

RECOMMENDED FOR GENERAL CULTIVATION IN OHIO.

Large Early York, (not serrate.)
Crawford's Early Malacoton.
George the Fourth.
New York Rareripe, or Morris Red.
Old Mixon Free.
Old Mixon Cling.
Crawford's Late.
Smock Free.
Heath Cling.

DISCUSSION ON GRAFTING.

EVENING SESSION DECEMBER FIFTH.

The discussion this evening was on the relative merits of grafting and budding. and of root and stock grafting.

Mr. Humrickhouse, being called upon by the President, said that he had many years' experience in root grafting, and is in favor of it for several reasons: it obviates the necessity of removing the seedlings from the seed beds to the nursery rows before grafting—thus saving labor. If the seedlings are left in the seed beds until they are two years old, they will average three grafts to each root. He grafted on roots, strictly speaking, putting one graft on the collar and cutting the lower part of the roots into sections, making from two to four of each stock. He has set out in orchard root-grafted trees with those grafted at standard height, and found the root-grafted trees to succeed better than the others. Some of those grafted at standard

height bursted and dwindled away; the season was unfavorable; the root-grafted trees lived better, are as large as the others, and I thing in general bear as early and as well. There are some varieties that ought to be grafted standard height—such as are straggling growers and of weak habit. Care should be taken in setting out root-grafted trees in nursery rows, to keep those of the same habit of growth together, so that the weak sorts will not be overshadowed. Planted 70 root-grafted trees in 1833, and have lost none, except by accident.

Dr. Warder stated the views of the Northwestern Nursery men. Some claimed that none should be root-grafted; others think that some varieties can and ought to be so worked. The result is, that a large majority approve of root-grafting of all but a few varieties, such as Esopus Spitzenberg, Rhode Island Greening, Northern Spy, &c. The inquiry in reference to a new kind generally is, will it succeed by root-grafting? Their objections are rather fallacious; some of it is really in some cases. because the trees grow too much. The Gilpin, Winesap, Milam, and many others, are regarded as successful on root-grafting. The real objection is, that Northern Spy and Esopus Spitzenberg, &c., died near the root by bursting. The objections confined to specific varieties, and seemed to prevail among their seedlings in the nursery rows, as well as grafted trees, and was caused by the bursting of the bark of such trees as grow with them from four to five feet the first season in the nursery rows.

Mr. Bateham said that a nurseryman in Wisconsin suggested that disease would be generated by the root on which the graft was set, dying, and thus engendering disease; but upon questioning the person, he found that he had no facts to sustain his objections. Dr. Warder resumed, and mentioned other theories, but said he never placed any weight on mere theories. He regarded a root-grafted tree as a cutting, and did not consider any graft would necessarily deteriorate when propagated by cuttings. He considered a root-graft, in many instances, better than any other, and they were certainly handsomer.

M.. Kelly said that he had been reading all that had been said on this subject, and thought that a great deal of the confusion resulted from a misapprehension of the subject. He considered a graft inserted at the collar or in the stock at any point above ground, as a graft proper; that any graft inserted in the whole or part of the root grown under ground, as nothing more than a cutting—the root being a method of assisting to "strike" the cuttings: that all true root-grafts are nothing but cuttings. He therefore thought that the effects of root-grafting will be to leave each variety to trust for its success to its own hardiness, while stock-grafting will give, in some measure, the hardiness of the stock to the graft. He illustrated his remarks by referring to roses, evergreens, and pears. He further said that he considered grafting high up liable to objection; that he thought the best way was to graft at not more than a foot from the ground.

On the practice of using succors as stocks, to which his attention was called, he said he thought that grafting on suckers was not different from grafting on other stocks; that such suckers will be hardy or weakly cording to the character of the tree from which they have originated, and in many instances would be superior as stocks to some seedlings.

Dr. Warder had seen some remarkably fine trees both in the nursery and orchard, which had been worked upon suckers. In transplanting such trees, however, he had often noticed a peculiarity of the roots, which were horizontal instead of descending.

Dr. Jones spoke of the influence of seedlihg stocks in feeding the graft. Thinks that mistakes are made by nurserymen not giving such close attention to the varieties which can feed themselves best, and, therefore, what kinds do not become inferior by root-grafting.

Mr. Bateham said the first he knew of root-grafting was about 25 years ago at Rochester, and it was regarded as a new invention and a great improvement. It was tried on Pears and Plums, and abandoned; but for apples it was almost uni-

versally adopted, and has been continued to this time—more than nine-tenths of all the apple trees sold there having been root-grafted; and he had never there heard of any of the difficulties now suggested.

Mr. Miller spoke of orchards planted near Dayton from root-grafted trees from Heick's nurseries, for 30 years. Has never heard of any failures of orchards there. They however have generally cultivated but a few kinds, and they free growers. Spoke of an orchard planted partly of trees grafted up several feet from the ground, and part at the surface: those at the surface all remain except a few; and those grafted up several feet are many of them gone from some cause. Some seedlings in the same orchard have done as well as those grafted at the surface. This process of root-grafting was sold as a secret method there in that day for $100. I have practiced root-grafting; some varieties are feeble, others do remarkably well; the Northern Spy succeeds with me, also the Rhode Island Greening. I plant my grafts in a bed one year before I remove them to the nursery rows. I think this gives better roots, and an opportunity to assort the plants when setting them out the next season. Last year I commenced in December, and grafted about 105,000, and, owing to the wet spring, I commenced planting them about the first of May, and finished about the 15th. I lost about one-half of all; they had started somewhat before I planted.

Mr. Humrickhouse said in regard to the root being used as an aid to the graft in striking as a cutting, that in his practice he does not take up his stocks until such time as the ground is in fit condition to plant in the spring, and then takes up the stock and grafts on the collar and on one and two lower portions of the root, and finds that the *root* as often lives and grows of those grafted on the lower part of the root as on the collar; and that therefore he does not consider the root-grafting any different in its effect from other grafting low down, as an aid to striking, but that results from the graft being covered in the ground somewhat. He regards the root-grafted trees as healthy as others, and referred to the Monongahela orchards.

Dr. Jones gave his views as to the process of assimilation in growth of grafts, and consequently the effect of stocks more or less thrifty.

Dr. Cone, of Coshocton county, spoke of a custom which prevails in his part of the State, of top-grafting trees since 1836, and this method has succeeded well. They have frequently stood as seedlings for 25 years.

Effect of the Stock on the Fruit.—Mr. Benedict said he had grafted Rambos on two seedlings—one on a sweet stock and one on a very sour one. He has always thought the Rambo of the sweet tree the best he ever ate, and richer and better than of the other tree. He also grafted a Bellefleur on a sweet stock, and has no doubt but that the stock, and especially sweet stocks, have an effect upon the fruit grafted upon them.

Dr. Jones thought stocks influence the fruit, and spoke of the circulation and assimilation of trees.

Mr. Bateham thought differently; that no perceptible effect was produced by the stock on the quality of the fruit.

Dr. Warder spoke of the new theories of vegetable physiology; that assimilation goes on at all points of the plant, but doubted that there was a regular circulation, as had been urged, and therefore inferred that a healthy stock was essential to induce vigorous growth, but would hesitate attributing any other influence to the stock; since genuine fruit was often produced from a new bud, unaccompanied by a single leaf of the variety budded upon the tree, which therefore furnished all the leaves to do the "assimilation of the sap," that had been referred to. The veriest Choke Pear would produce delicious Bartlett, from a flower bud, without a single leaf of its own kind.

Mr. Harr says he has in his orchard an apple, hard and juicy, upon which an American Golden Russet has been modified so as to be very nearly half way between the original and grafted sort, and differs from any other American Russet he has ever seen.

The discussion was further continued by

Messrs. Cone, Jones, Humrickhouse, Bateham, Kelly, and others.

Mr. Miller, of Enon, Clark county, in regard to the power of absorption by the roots, gave an instance of pouring brine around a peach tree, which, after several weeks, began to die, and the fruit ripen prematurely. He tasted a number of the peoches, and they distinctly tasted of the salt.

Maj. Hunt spoke of a single apple gathered from a tree and presented to him, one-half Bellefleur and half Russet in color and taste.

Mr. Benedict gave an instance of a tree in his orchard, with apples of different qualities (although very like,) on different sides of the tree, which was a regular thing.

Mr. Ernst gave an instance of a blossom bud of the Bartlett, inserted in a pear stock, which produced a fruit of the Bartlett, and matured it without leaves to the bud; there were other Bartlett leaves on the tree, but not on the limb.

Mr. Bateham gave a similar instance as to the Plum.

The hour being late, the relative merits of budding and grafting were not generally discussed. Some thought budding an easier and surer method of propagating: others like grafting the best, because the young trees grew straighter. It was thought that the difference in effect between budding and grafting above ground, would be little; but that budding would differ from root-grafting the same as top-grafting would.

The discussion on insects injurious to fruit trees and vines, and the diseases that affect the same, was deferred for the next meeting, owing to a want of time. The officers of the Society earnestly request that members will give particular attention to these matters, as well as other facts of interest pertaining to fruit culture, during the coming year, and come prepared to cammunicate the results of their observations at the next meeting of the Society.

ELECTION OF OFFICERS.

On Wednesday morning, December 6th, 1854, the following gentlemen were duly elected officers of the Ohio Pomological Society for the ensuing year:

President—A H. Ernst, of Cincinnati.

Vice President—Dr. I. G. Jones, of Columbus.

Treasurer—M. B. Bateham, of Columbus.

Secretary—A. B. Buttles, of Columbus.

NEXT MEETING OF THE SOCIETY.

The President suggested that it might be deemed advisable for this Society to meet hereafter biennially, as was the practice of the National Society; and in that case, he thought our meetings should be held in the alternate years from that Society, and hence he should be in favor of meeting again next year.

After some general discussion, on motion, it was

Resolved, That the subject of the time and place of the next meeting be left to the decision of the officers of the Society.

LIST OF FRUITS FOR OHIO.

Discussion on Apples, at a joint meeting of the Ohio Pomological Society and State Agricultural Convention, at Colunbus, Wednesday evening, Dec. 6th, 1854: A. H. Ernst *and* J. K. Green *in the Chair,* M. B. Bateham, *Secretary.*

The object of the meeting was stated by Dr. Warder and M. B. Bateham, viz: to agree upon a list of apples to be recommended for general cultivation throughout the State of Ohio.

On motion, it was agreed to take up the several kinds of apples in the order of their season, Summer, Fall, and Winter varieties.

Early Harvest was reported as good in all parts of the State—not always a profuse bearer, but fair in most localities; does best in rich or well mannured soil. Highly approved wherever known.—Recommended unanimously.

Early Strawberry.—Highly approved south and in center of the State, also in north-west and north-east. Not much known in some of the northern counties, but does well wherever known.—Recommended unanimously.

Large Yellow Bough or Sweet Bough.—Gen. Worthington had grown this extensively for many years in Ross county, and approves it very highly. Was reported

good in all parts of the State. Not a great bearer. Dr. Warder proposed to recommend it only for limited cultivation.—Recommended with one dissent.

American Summer Pearmain.—Proposed by Dr. Jones, and highly recommended by all who know it, but passed as not sufficiently known.

Golden Sweet.—Generally known in different parts of the State, and highly commended, especially for baking, for apple butter, and for stock.—Recommended with one dissent.

Maiden's Blush.—Commended by numerous gentlemen, especially for its fine looks and for market. Some like it for cooking and for the table; does well in all parts of the State—is larger and of less flavor south than north.—Recommended with several dissents.

[This is beautiful to sell, always productive and good for the kitchen, but has too much and too disagreeable flavor to be recommended for the desert.—Ed.]

Fall Pippin or Golden Pippin.—Well known and highly approved in all parts of the State. Keeps best and has best flavor at the north, but is largest at the south.—Recommended with one dissent.

Cooper.—Dr. Hempstead said he believed the history of this apple had not yet been fully stated. The grafts were brought from Boston to Marietta by Mr. Adams, of Zanesville, who called it a French apple, the original tree having been imported, as he believed, from France. All present who knew the apple called it first rate; but some gentlemen thought it not sufficiently known to warrant its recommendation for general cultivation, especially in the northern part of the State.—Recommended with one dissent.

Rambo.—Was pronounced first rate, especially in central parts of the State. Dr. Warder said it was good at the south, but ripens early, becomes dry, and does not keep as well as at the north.—Recommended unanimously.

American Golden Russet.—Messrs. Worthington and Green said it was first rate when in perfection, but with them it soon perishes, and is not generally of fair and healthy growth. Mr. Steele finds it first rate, good size, and trees healthy, considers it one of the best of winter apples for the table. Other gentlemen said it was not of attractive appearance, and not good for market; though persons who knew it would always buy it. Dr. Cone said trees were not healthy with him. Dr. Warder considers it first rate; tree of slender growth, and forming a small head, should be planted nearer than other trees.—Recommended unanimously.

Yellow Bellefleur.—Much approved in most parts of the State; not so large and handsome at the north as in central Ohio.—Recommended with several dissents.

White Bellefleur or Ortley.—Mr. Ernst and others from southern Ohio, approved it highly, and all agree that it is a good apple, and adapted to most parts of the State.—Recommended with several dissents. [It was evident that this fruit was not known by many of the convention.]

Belmont or Gate.—Mr. Humrickhouse said this apple was considered indispensable in his region; thinks the tree rather tender. Gentlemen from central and northern Ohio spoke of it as very excellent, and deserving general cultivation.—Recommended for general cultivation in northern half of the State.

Newtown Spitzenberg.—Very highly approved at Cincinnati, and also in other parts of the State wherever known, for table and for market.—Recommended.

Winesap.—Well known and everywhere approved, though not of first rate qualities. Recommended.

Winter Sweet Paradise.—Specimens presented by Mr. Brush, who commended it very highly, especially for baking. Has been grown by Wm. Merion, near Columbus, for 10 or 12 years. Said to have come from Pennsylvania. Mr. Bateham thought it was identical with the Wells Sweeting, of New York. All agreed that it was a first rate sweet apple.—Recommended for general trial.

Talman Sweeting.—Recommended by Mr. Bateham and several others as very excellent for baking, and as a great bearer,

profitable for stock.—Passed as not sufficiently known.

Broadwell Sweet was highly commended by Mr. Ernst and others from Cincinnati, near which city it originated. Elliot's description was read, and his commendation seconded.—Recommended for general trial.

Roxbury Russet.—Condemned by many as uncertain, and liable to speck and rot.—Passed as not worthy general commendation.

Newtown Pippin.—Highly commended generally, but General Worthington and several others found it speck with them. On sandy soils not generally good, also on beech clay soils at the north. Prof. Mather thought it was good only on limestone soils. Gen. Worthington thought this and some other old kinds are losing their health and vitality.—Recommended with several dissents.

Rawle's Janet or Geneting.—Dr. Warder said this was *the* winter apple of southern Ohio, Kentucky, etc., but he was afraid it was not generally known through the State, especially in the north. Several gentlemen from different parts of the State said they knew it, and approved it highly.—Recommended unanimously.

Several other apples were proposed by different members of the Convention, but passed as not being sufficiently known or tested in all parts of the State.

Mr. Moorman's Fruit Room.

The Rooms should not be on the ground floor, because it is far more difficult to keep one cool in that position than if raised into the air. If circumstances render a ground floor indispensable, then the access of warmth from the earth should be cut off by double floors and air passages between them.

It must be ventilated, without the admission of light, except in a very inconsiderable degree. The object of ventilation is to carry off the excessive moisture that accompanies fruit when first stored, or such dampness as may otherwise form.

It must be kept as cool as possible, without freezing; that is to say, it must never be warm, and never cold. If warm, the chemical changes that result in the decay of fruit are rendered more active and intense. If frozen, all flavor is destroyed. The way in which frost operates in destroying the flavor of fruit is unexplained, but the fact is certain, as was, indeed, proved in a curious way two or three years ago. A gentleman residing at Boston, U. S., wishing to send to London specimens of the famous Boston Nectarine, packed them in ice. In a very short time they arrived, plump as when gathered, with all the beautiful appearance produced by the rich and glowing colors that only form beneath such a sun as shines in the United States—but they were tasteless. In order to secure a Fruit Room against frost, the room is lined, and on the north roof even doubled lined with wood, so as to have one, or on the north two, layers of air between the wainscoting and the outer wall. The same precaution keeps off such solar heat as would be inconvenient during autumn and winter.

In addition, in case of very cold weather, a small stove is provided, and here no doubt more attention is demanded than in any part of the arrangements. A negligent servant would be almost certain to overheat the room one day, and to let the fire out in another; or, as a matter of course, to light the fire in warm weather, and forget it in a hard frost. It is, therefore, a question whether this fire-place could not be dispensed with by a further casing of wood in the inside of the room. Half-inch boards are so cheap now, that it is quite possible that an additional casing would be cheaper than a fire-place, the need of which it would obviate.

We believe no register is kept of the temperature in Mr. Moorman's Room, but we can be hardly wrong in saying that 40° and 50° should represent the occasional extremes, 45 being the mean.

Fruit Rooms—Keeping Pears.—The time has now arrived when intelligent cultivators are no longer satisfied with a supply of the best fruit during the few weeks when it may be plucked fresh from the tree.

The best artificial method for prolonging the period of maturity must be asccrtained; and when once reached cannot fail to be sought with eagerness. For it becomes a matter of no little consequence whether the cultivator, who has expended a considerable sum to purchase, raise, and carefully cultivate a fine orchard of trees, be permitted to eat the best fruit only during two or three months of "the fruit season," or to feast on melting pears all through a long winter and till the fresh trusses of strawberries are reddening his garden beds the next summer. This is no chimera—it will be done.

The old-fashioned receipt for keeping winter apples was "to lock them in a cool cellar and hide the key." But this simple process will not answer for pears. These evaporate moisture much more rapidly than apples, which have a more impervious epidermis. Place an apple in a dry room and it will continue plump for a long time. During the same period a pear will become badly shriveled.

Winter apples are usually subjected to many changes before the time comes round for them to be eaten. They are placed in a dry room, tending to evaporate their moisture ; then are removed to damp cellars,where moisture is re-absorbed; changes of temperature, besides being accompanied alternately with dryness and humidity, also affect the keeping qualities by the direct action of heat and cold. It is not surprising that pears, when subjected to these changes, being much more susceptible than apples, should be found so hard to keep. This is the reason why we so often hear the complaints, "I can't keep winter pears," or "they won't ripen with me : they either wither, or rot, or both"—"winter pears are a humbug."

If the best Bartletts and Virgalieus could be taken from the tree five days before their usual period of maturity (as they always should be*) and submitted to a temperature scarcely above freezing, and where no change either in temperature or moisture could occur, they would keep an indefinite length of time; it is hard to say how long, whether seven months or seven years, and the nearer they are made artificially to approach this condition the longer they will keep. This, with the exclusion of light and moisture, which always tend to produce decay, constitute all that is at present known and established relative to the keeping of fruit in a simple, unprepared state. The exclusion of air from fruit in its simple, ordinary condition, is of less importance than is usually supposed, as it usually contains within itself all the elements for fermentation.

In constructing a fruit room, therefore, the first and leading requisite is to guard against changes of temperature, that is, to exclude frost and heat. Hence the same principle substantially must be applied as in the erection of an ice-house, the adoption of double walls, double roof, and double doors, forming perfect non-conductors of heat.

The annexed plan exhibits, in substance, the best mode at present used for the construction of the walls and shelves. The walls are double, and may be made of brick or of matched boards; the former will be most secure from changes of heat and cold. The enclosed plate of air serves as an additional non-conductor; but, as its circulation in this confined state carries the heat from one wall to another, a filling in of some porous substance to prevent this circulation is a decided improvement. Col. Wilder is very successful with charcoal dust—saw dust or dried tan would be as efficacious. On each side of the room is a window, corresponding with the two walls, so that the room may always be kept dark; each shutter is made of boards, double, or with a confined portion of air. These windows serve for cleaning and airing the room before gathering the fruit, and for ventilation in a few rare instances when occupied. The doors are also double. In ordinary cases, all the ventilation required is effected by registers placed in the walls near the floor and roof. The table at the center of the room is used for the reception of fruit before placing on the shelves. It is covered with cotton or other soft substance to prevent bruising. The shelves are divided into narrow strips, with the space of an inch between each, to facilitate the circulation of air through them. The upper ones are raised at the back that the fruit may be easily seen. All are provided with a ledge-board in front.

Marshall P. Wilder, of Boston, has given much attention to the preservation of winter pears, and has been so successful as to keep good specimens through the whole of spring into the summer months. His fruit room was at first below ground, or, in other words, was a cellar, but he found it too warm, too damp, and not well fitted for the purpose. He then adopted the opposite extreme, and constructed a fruit room over his carriage house, having double walls, filled with powdered charcoal. The fruit is arranged in shelves, and on the approach of the severest weather of winter it is removed and packed in boxes with a thin layer of thin rye straw between each tier. The boxes are then placed together and

* There may be a very few exceptions—such, for example, as the Andrews.

covered with hay three feet deep. Joseph Moorman, of Boston, has a fruit room, also over a carriage house, the walls not filled in, and perhaps in other respects not so secure from frost as would be desirable. A small stove is, therefore, placed in one corner, to be used when necessity demands. (It is also used for repelling moisture.) He succeeds admirably, however, in preserving an even temperature, and states that, "when the weather becomes frosty, it is several days before the thermometer is affected as much as one degree." The fruit room of the London Horticultural Society, under the charge of Robert Thompson, is, doubtless, a more perfect structure; the double walls, eight inches apart, are filled in with dry moss, and, according to the statement of R. W. Sargent in a former number of the Horticulturist, fire is never used, although the thermometer in open air has sunk to five degrees below zero. The fruit is on open shelves. Long continued severe weather, as often occurs in this country, would, of course, be more difficult to guard against than a sudden snap.

It is obvious that artificial heat should be used with extreme caution, as there are changes of temperature and of moisture that cause speedy decay. Ventilation by opening the room to the air outside only to be effected when the temperatures within and without are the same. Some French Horticulturists have made use of the chloride of calcium* for absorbing the superabundant moisture of their fruit rooms, which entirely obviates the necessity for currents of external air, and without any change in temperature. It is placed in a shallow wooden box, so as to expose two or three superficial feet to the air, the box being open also at one corner, which being placed lowest upon a table the liquid chloride immediately drains off and runs into an earthen vessel. It may then be dried over a hot fire, and be as good as before.

The amount of moisture in different localities and situations is no doubt quite unlike. Some cellars are much dryer than others, which is a reason that some are quite successful in keeping fruit, when others with equal care entirely fail. An important object in selecting an upper room is not, however, merely to avoid moisture. To secure coolness is the main reason, especially during the last half autumn, when a great many winter pears are permanently injured for keeping by too much warmth. But the moisture of the air should be so regulated as never to condense upon the fruit (kept at the same temperature), producing what is usually termed sweating, nor to be so little that the fruit shall throw off its juice to the dry atmosphere, producing shriveling. A little experience in a well constructed room, would enable any one to manage this point accurately.

We should have mentioned, when speaking of the construction of the shelves, that they should be evenly covered with some soft substance, one of the best of which is hay made from the spear of June grass, (*Poa pratensis*), which is remarkable for its softness and elasticity. The fruit should then, after being carefully assorted from all bruised or decayed specimens and wiped dry, be placed on a single layer upon this, without touching.

It will be understood by all familiar with keeping winter pears, that when the specimens approach the usual period of maturity they should be successively removed to a warmer room, where a few days will develop their golden color and their melting texture.

As we have already observed, the great leading requisite is a low and uniform temperature and exclusion from light; the fruit having the elements for fermentation within itself, the absence of air is not of great importance, under ordinary circumstances. The great success which has been found to attend packing in charcoal, sawdust, chaff, etc., is largely owing to the preservation of a uniform temperature by these non-conductors of heat, and to the exclusion of heat, with occasionally the additional advantage of admitting of being placed in a cold and damp cellar by absorbing the surplus moisture.

All this care will, no doubt, appear to some as altogether too great for practice. But, even supposing that the room and its management will cost as much as the fruit garden and its cultivation, would not doubling or tripling the period for the maturity of pears amply repay all trouble? And, estimated by money merely, would not such a room, for the marketer of the finest specimens, prove eminently profitable by enabling him to sell his best specimens for twenty-five cents each, as has been repeatedly done both here and in Europe, for well kept rare sorts? Many thousand could be placed in a single building; and, as high profits are in future to accompany the cultivation of the very best, it is well worth while to look at the mode that shall contribute to the highest perfection.

Such a room as we have described would be an admirable place for grapes, either deposited on the shelves or (still better) suspended by wire hooks at the apex of each bunch, causing the bunches to spread and the grapes to hang apart and prevent rotting.

* Obtained by heating common chloride of lime.

In all cases where a cellar is used for keeping fruit, as is usually the case with common winter apples, the evils of dampness may be much lessened by placing the shelves in the center and leaving a space all around for passage. These shelves may be suspended on iron rods, at such a distance from the wall and floor that the most expert rat can never reach them by his longest leap. They may be twice as wide as usual, as they are reached from the passage on both sides.

The Trees in Convention.

We are persuaded that more trees die of the laziness or carelessness of their owners than from all other causes united. Were they gifted with tongues, and assembled in convention, we think there would be indignant remonstrance at their untimely "taking off," and the cause of their death would almost invariably be laid to the fruit grower's door. Whether such a convention has actually been held or not, we do not presume to affirm; but we find among our editorial notes reports of speeches said to have been delivered at such a tree meeting. It seems the orchard and garden trees took a hint from the "Joint-worm Convention," held sometime this last summer, down south, which they saw reported in the papers; and thought if the field insects could muster a gathering, it was fair for them to be up and doing. So a meeting was called at Pomological Hall, to protest against death's doings, and to devise ways and means to promote the longevity of the race. The notes state that the meeting was unusually full, and that the natives of the orchard were all astonished at their own strength and numbers. The chief speakers were invalids, who bore in their persons unequivocal evidence of harsh usage and neglect. A venerable gentleman, by the name of Apple, was among the first to address the chair. There was a terrible stoop in his shoulders, and a sad crook in his limbs, occasioned by the heavy burdens he had borne. His collar was perforated with holes, and little piles of sawdust lay about him as if he were about to make a sawdust pudding instead of a speech.

"You see, gentlemen," said he, "that if this convention had been here a little later, I should not have been here to attend it. This is my last speech, as it happens to be my first. I speak from the borders of the grave, and trust, therefore, that my words will be heeded. You see in me the marks of premature age, that I am honey-combed by the borer, and am soon to go the way of all trees. I might have continued my useful labors for generations to come, had I not been over-tasked with burdens, and had my friends seasonably guarded me against my enemies. But not a finger did they lift to rout the caterpillars from their nests, or to save me from the ravages of the canker-worm. Year after year violence was done to my taste in dress, and instead of the beautiful green I most delight in, I was forced to put on russet and dingy brown in mid-summer. The borers seized me by the collar and plied me with their instruments of death, and not a soul of the bipeds that thrived on the fruits of my toil thought it worth while to knock out their teeth. I cannot stand it much longer. I move you sir, that we appoint a committee to draw up a remonstrance, in view of our common grievances."

A short-legged gentleman next arose, and was introduced to the audience as Mr. Pear. Some called him a dwarf, but he did not relish the name, and always feigned youngness to account for the lack of length in his perpendiculars. His coat was a pepper-and-salt hue, and some called him a *scaly* fellow.

"I rise," said he, "to second the motion of my friend, Mr. Apple, and I do it all the more cheerfully, because I have certain grievances of my own that call for relief. It is enough to bring *blight* and mildew upon any body, that has the susceptible soul of a pear within him, to be treated as I am. Because I happen to be a modest gentleman, and am willing to take lodgings with my country friend, Mr. Quince, I am treated as a person of small consequence, and am jammed into quarters close enough to breed distempers of all kinds. Instead of the great ado men make about the blight, the only wonder is that the race was not all blighted long ago. I am a wonder to myself when I remember the usage I have survived. At first I was over-fed, and dosed with stimulants, that I might grow rapidly and gratify my owner's cupidity with a large crop of fruit. My limbs had no opportunity to harden, and the first killing frost sloughed them off every winter. Then I began to bear, and that was the end of my stuffing. I can now scarce get nourishment enough to make fruit, and as to making wood, it is as impossible as a new creation. I am prematurely old, mossy, hide-bound, and to top all covered with scale-bugs, that are sapping my life. Not one of the ingrates whom I have annually feasted with my dainties, has had the manliness to touch me with potash or soda, and rout these enemies. I shall go for the motion."

Mr. Peach was on his feet in a twinkling, and said that, "the grievances presented by the gentleman that preceded him, were milk-and-water tales in comparison with the abuse which had been heaped upon him. If the age of martyrs was not already passed, he would readily pass as the John Rogers of his race, save that to make the case parallel the wife and all the children should have been tortured with him." Here he gave a hectic cough by way of emphasis, and which showed that he was dealing with realities. "The abuse begins in my case previously to birth. We are bred as promiscuously as the fish, and the result of this low state of morals, is that the honor of the family is im*peached*, and every woman among us gets jealous and dies off with *the yellows*. When we were young and had vigorous constitutions, we could get along with almost any fare and do good service. Our very hardiness invoked neglect, and that treatment has become so chronic, that multitudes of us perish under the regimen. You see the worms have anticipated the feast of the grave in my case. I am attacked above ground, and my life-blood is flowing out through their deadly wounds. No one thinks to be after these wretches with a stick or a ——" Here he was taken with a fit of coughing, and ruptured a blood-vessel which broke up the meeting.

The convention was timely, and the discussion was on home topics, as we discovered the first time we visited our own garden. There were the sawdust piles about our apples and quinces. We took a sharp-pointed knife, and a piece of wire, and were immediately upon the track of these animal augers, *auguring* so ill for their future usefulness. The white-livered wretches caught it for once, so that we shall have a clear conscience when that remonstrance of the convention comes to town. The pears, some of them were covered with the white scale insects, which we soon scattered with a strong decoction of soft soap suds and a coarse brush. The peach trees we cleaned around the collar, cutting out the white worms that clustered under the oozing gum, and treating the wounds with a good covering of wood ashes. We saw, in a very short examination, that the speakers at the convention were manifestly dealing in home truths in their remarks. Possibly some of our readers may find their own gardens an illustration of the same truthfulness. At all events it will be perfectly safe to examine your trees without delay—do not let them die of neglect.

W. C.

Am. Agriculturist.

The Humbug of Many Varieties.

BY GEORGE JAQUES.

We have, in our grounds, some three hundred pear trees, more or less, comprising about seventy varieties of fruit. The trees are of such size as nurserymen usually retail at from one to three or four dollars a piece. Calling these three worth five hundred dollars, in their present condition, if by some conjurer's art, their number of varieties could be reduced to about a dozen of what we consider the most valuable sorts, we should then estimate the same trees to be worth at least eight hundred dollars. In mercantile phraseology, Profit and Loss stands Dr. in the sum of $300—to the reputation of having seventy instead of a dozen varieties of pears. In illustration of this account of trash accumulated on our hands, we have among our trees the Lewis, the Passas du Portugal, Beurre de Mons, and others about the seize of blackberries, which—if they ever mortify us by fruiting again—we intend to eat with a spoon after the fashion of strawberries and cream, hoping only that we may have a great deal of cream and very few of the pears.

Next we have a class of pears beatiful as the fabled fruits of the Hesperides, but needing no hydra-headed monster to guard them against the depredations of those who have tasted them once. Of this class Chelmsford is a type, Pope's Scarlet Major another, the Reine des Poires another, etc., etc. Then we have a lot which "came highly recommended," such as the Bleekher's Meadow, the Dunmore, etc., which our pigs always refuse, except on those occasions when his darlint of an Irish keeper has forgotten "*intirely*" to feed him for a day or two in succession. A fourth class were received under the prestige of such high-sounding names that we feel certain they must be something. But of this class we must sorrowfully say—"*stat magni nominis umbra.*" Their fine names contrasted with their miserable plight have been sneered at, at horticultnral exhibitions, their owner's taste called into question, and their history concluded by starving poor piggy into an appreciation of their otherwise latent excellence. To this class properly belongs certain winter varieties, which we shall designate as the shrivellers. Then comes some for which we paid smartly, among them, the Colmar d'Aremberg. This, we will admit, has proved tolerably palatable some years, but we do not think the pleasurable moments of our life would be much abridged if we and Colmar d'Arem-

berg were never more to meet in our mortal pilgrimage.

Again, we have from time to time become the proprietor of certain other "very new" varieties—*cheap enough* now—but so scarce when we purchased them that we were only able to purchase a single little miserable specimen tree—granted to us as a special favor at the moderate price of five dollars! The Grosse Calabasse heads the list of these; the Eyewood is not much too good to follow after, and—but we don't care to prosecute this subject further.

If the art of grafting has lost its virtues next spring, we shall feel strongly tempted to put ourselves in a way to remain in blissful ignorance of all the rest of these same new varieties, and at the same time complete our education in regard to all the others above named.

We want pears that our friends and ourselves can enjoy—to eat, not to exhibit at horticultural fairs! What is it to be able to show a hundred varieties of pears at an exhibition compared to having the finest and choicest of this fruit to set before one's friends? Where is the profit or honor, or pleasure, of these same varieties thus displayed, if the final destination of three-fourths of them is the pig-stye? And because, if our "more enterprising" (?) neighbor, Snooks, happens to get out one hundred and one varieties, *he* wins the laurels, and we are at once left in the lurch, with only the miserable consolation of going home to share with our pig in what other gratification our pears may be capable of affording.

As of pears, so in less degree of all our fruits. We remember to have paid a dollar and a half for the Carter grapes—a miserable savage tree from its native wood! Perhaps, though, we are too severe—having never tasted this fruit: for we do assure you, gentle reader, that we—that is, ourselves and our pig—have neither of us succeeded, up to these present writings, in getting the monstrous pulp of this grape far enough down our throats to be able to know how it would lie in our stomachs. Newland's strawberries we fortunately escaped: also several of the patent currants, etc.

We might go on this way through the whole circle of fruits and ornamental trees and plants, but we have already arrived in sight of an objection which we knew we should have to meet. We shall be asked: If some one had not experimented with new varieties, how would you have been supplied with such fruit as your Paradise d'Automme, Rostezier, Beurre d'Anjou; your Leland's Pippins, your Dutch Currants, your Hovey strawberries, etc., etc.? True, very true; but we think we can answer—at least interrogatively, after the most approved Yankee fashion.

If Columbus had never discovered America, how would our politicians ever have opportunity to manifest their benevolence in saving the Union? It is very well, it is important, indeed, that somebody should give attention to the raising and testing of new varieties of fruits; but is that any reason why every one who may have a bit of ground, should fill it up with all manner of new trashy fruits which nobody has fairly tested? The wholesale nurseryman, the whealthy amateur, horticultual societies who have experimental gardens, men very fond of and willing to pay for distinctions at horticultural exhibitions, should be our experimenters, our pioneers on the western frontiers of horticulture. As for the rest of us, we can better afford to buy their experience than to take a share in it. If no better plan can be devised, let the members of the horticultural society each agree to test one or two new and different varieties in a season, and the work of improvement would progress rapidly enough for all valuable purposes. At any rate our dearly bought experience has taught us to be shy of the new varieties. We ought to be, we hope we are willing to do our part; but we confess we have not much enthusiasm for doing more.—*Practical Farmer.*

Agricultural Orators.

In these times, when there are so many agricultural associations, fairs, meetings for discussions, and lectures—when there is a great desire in the public mind to learn something concerning the important interest of agriculture, the demand for public speakers is so great that men cannot readily be found who will give satisfaction. The popular taste requires eloquence, brilliancy, ready off-hand talent. This is in accordance with the prevailing spirit of the age. The desire is for action, energy, show.

To gratify this taste, and to cause a general attendance on fairs, for the sake of the profits, agricultural Societies have taken pains to employ as orators, eloquent men, men of renown in political life. The Houstons, the Everetts, the Douglasses, the Filmores, the Sewards, and the Casses have been earnestly sought to lend the aid of their eloquence and names, to render successful State and County Fairs. They are "lions" and will "draw a crowd." People have read their speeches, have heard their virtues lauded "on the stump," and in the political newspaper, and they are anxious to listen to them. They desire to see these great men of the nation, because they

have held high offices, and been regarded as the main pillars of our national edifice. They are eloquent,—they command attention, and their teachings are too often received with the most implicit faith, when they "know nothing" of agricultural pursuits.

Though it may be good policy, temporarily, to employ such men, political men, lawyers, and others of that class, we do not believe that it will result in good. Ordinarily, these men are ready to accept invitations, because they hope to gain personal or political influence thereby. They feel that, by engaging in such matters, they will increase their prospects for political advancement. They do not care, while the people do not ask, whether they possess any agricultural knowledge or not. They can talk on general principles, or glean from a few agricultural books, dig up and set before an audience, the bones of Cincinnatus, make a "rhetorical flourish, receive the applause of the multitude, and their task is done.

Now, we do not object to lawyers and political men lecturing on the subject of agriculture, when they know whereof they speak. If they have had practical knowledge of the farm, or if they have obtained from study and observation sufficient knowledge to teach with safety, by all means let us have their aid and advice.

There are some professional men who understand the common affairs of life, who find time and an inclination to gain much useful information outside of their profession. There are many clergymen in this State who cultivate the earth; men who have had wide experience in the pursuits of the farmer. Such are the men to speak. They have something to talk about, and when they choose, they can exert a wide influence on the community. If every clergyman in the State was as earnestly engaged in the progress of agriculture, as in some other secular interest, there would be a vast improvement in this department of industry.

Physicians generally are interested in agriculture, more so perhaps than any other class of professional men. Their preparatory studies lead them in such a direction as naturally gives them a taste for agriculture. We find some of the most useful members of our agricultural Societies belong to the medical profession. These men, if they can command the time are usually qualified to give valuable agricultural addresses.

Teachers and professors in Colleges and Academies, are often well qualified for the work. Often this class of men have a few acres of ground on which they have practiced successfully, and with minds disciplined to study, they can easily find material for a good lecture.

Finally, farmers themselves can lecture. There are more than one hundred hard working practical farmers in New Hampshire, fully competent to prepare agricultural addresses suitable for common agricultural meetings. They have the material in their minds, gathered from time to time, by actual observation, all that is needed is arrangement. We hope all interested in agricultural movements will think of these things.—*Granite Farmer.*

Root Pruning.

Before entering on the subject of root-pruning of pear trees on Quince stocks, I must premise that handsome and fertile pyramids, more particularly of some free-bearing varieties, may be reared without this annual, biennial, or triennial operation. I have a large plantation of pear trees on the quince stock, which bid fair to make very handsome and fertile pyramids, yet they have not been root-pruned, neither do I intend to root-prune them; but I wish to impress upon my readers, that my principal object is to make trees fit for small gardens, and to instruct those who are not blessed with a large garden, how to keep their trees perfectly under control; and this can best be done by *annual* or at least biennial, attention to their roots. For if a tree be suffered to grow three or more years, and then root-pruned, it will receive a check, if the spring be dry, and the crop of fruit for one season will be jeopardized; therefore, those who are disinclined to the annual operation, and yet wish to confine the growth of their trees within limited bounds, by root- pruning—say once in three years—should only operate upon one-third of their trees in one season; they will thus have two-thirds in an unchecked bearing state, and those who have ample room and space, may pinch their pyramids in summer, and suffer them to grow to a height of fifteen or twenty feet without pruning their roots. I have seen avenues of such trees in Belgium really quite imposing.

Pyramidal pear trees on the quince stock, *where the fruit garden is small*, and the real gardening artist feels pleasure in keeping them in a healthy and fruitful state, by perfect control over the roots, should be operated upon as follows:—A trench should be dug round the tree about eighteen inches from its stem, every autumn, just after the fruit is gathered, if the soil be sufficiently moist; if not, it will be better to wait till the usual autumnal rains have fallen; the

roots carefully examined, those inclined to perpendicular growth cut with the spade, which must be introduced quite under the tree to meet on all sides, so that no root can possibly escape amputation, and all the horizontal roots, except those that are *very small and fibrous*, shortened with a knife to within a circle of eighteen inches from the stem,* and all brought as near the surface as possible, filling in the trench with compost for the roots to rest on; the trench may then be filled with the compost; well-rotted dung and the mould from an old hot-bed, equal parts, will answer exceedingly well; the surface should then be covered with some half-rotted dung, and the roots left till the following autumn brings its annual care. It may be found that after a few years of root-pruning, the circumferential mass of fibres will have become too much matted, and that some of the roots are bare of fibres towards the stem of the tree; in such cases, thin out some of the roots, shortening them at nine inches or one foot from the stem, this will cause them to give out fibres, so that the entire circle of three feet or more around the tree is full of fibrous roots near the surface, waiting with open mouths for the nourishment annually given to them by surface dressings and liquid manure.

Thus far for the gardener, who does not mind extra trouble, who, in short, feels real pleasure in every operation that tends to attain his end; but it is not every amateur gardener that can do this, nor is it always required in the south of England, except for small gardens and in rich moist soils, in which pear trees are inclined to grow too vigorously, but with our too often cool, moist summers in the northern counties, annual root-pruning is quite necessary to make the trees produce well-ripened wood; in other cases, as I have before observed, shortening the shoots in summer, taking care to produce a handsome pyramidal form, and if they are inclined to grow vigorously, occasional (say biennial or triennial) root-pruning with the spade will be quite sufficient.

The following will be found a good selection of Pears for pyramidal trees on quince stocks. These trees may be planted in rows, five or six feet apart, or a square may be allotted to them, giving each plant five to six feet, which will be found amply sufficient for root-pruned trees. Some few esteemed sorts of pears do not grow well on quince stocks, unless "double worked," *i. e.*, some free-growing sorts are budded on the quince, and after having been suffered to grow for one or two seasons those not so free-growing are budded on them. For twelve varieties, placed in the order of their ripening, the undermentioned may with safety be recommended.

1.	Doyenne d'ete	July
2.	Bonne d'Ezee	August
3.	Bon Chretien (Williams)	September
4.	Baronne de Mello	October
5.	Fondante d'Automne	October
6.	Louise Bonne de Jersey	*m. & e.* Oct.
7.	Alexandre Lambre	Nov. & Dec.
8.	Beurre d'Aremberg	December
9.	Beurre Sterkman	*e.* December
10.	Zephirine Gregoire	January
11.	Josephine de Malines,	March
12.	Bergamotte d'Esperen	Ap'l and May

For twenty-four add—

13.	Saint Denis	August
14.	Beurre Superfin	September
15.	Colmar d'ete	September
16.	Beurre Hardy	October
17.	Doyenne Gris	*e.* October
18.	Douchesse d'Angouleme	*b.* November
19.	Urbaniste	*e.* November
20.	Winter Nelis	December
21.	Beurre d'Anjou	*e.* December
22.	Bezy d'Esperen	January
23.	Prince Albert	March
24.	Prevost	April

The above succeed well on the quince, and form well shaped pyramids.—*Rivers' Miniature Fruit Garden.*

Proper Distance for Planting Pyramidal and other Fruit Trees.

Pyramidal pear trees and bushes on quince stocks, root-pruned for small gardens, four feet apart.

The same in large gardens, not root-pruned, six feet apart.

Pyramidal Pear trees on the pear-stock, root-pruned, six feet apart.

The same roots, not pruned, eight to ten feet, the latter if the soil be very rich.

Horizontal espalier pear trees on the quince stock for rails or walls, twelve feet apart.

Upright espaliers on the quince stock for rails or walls, four to six feet apart.

Horizontal espaliers on the pear-stock for rails or walls, twenty to twenty-four feet apart.

Pyramidal plum trees six feet apart.

Espalier plum trees, twenty feet apart.

Pyramidal apple trees on the paradise stock, root-pruned for small gardens, four feet apart.

* If they have not spread to this extent the first season, or even the second, they need not be pruned, but merely brought near to the surface and spread out.

The same, roots not pruned, six feet apart.

Espalier apple trees on the paradise stock, fifteen feet apart.

The same on the crab stock, twenty to twenty-four feet apart.

Peaches and nectarines for walls, fifteen to twenty feet apart.

Apricots for walls, twenty feet apart.

Cherries, as bushes on the Mahaleb stock, root pruned, for small gardens, four feet apart.

The same, roots not pruned, six feet apart.

Espalier cherry trees on the Mahaleb, for rails or walls, twelve to fifteen feet apart.

The same on the cherry stock, twenty feet apart.

Standard pear, apple, plum, and cherry trees, for orchards, twenty feet apart.—*Rivers' Miniature Fruit Garden.*

The Peach Trellis of Thomas White, Esq.

In the autumn of the year 1851, Mr. White, while walking through the grounds, happened to see my small Kerrian trellis with moveable lights, and on his return home, the idea occurred to him that it might be enlarged, and the principle improved upon, so as to be able to grow fruit enough for a large family. In the autumn of that year he accordingly built a trellis-house of the following dimensions :

Length	80 feet.
Width (inside)	12 "
Height at back	8 "
Height at front	14 inches.
Rafters (fixed 20 inches apart)	12 ft. long.
Trellis (15 inches from the glass)	13 " wide.
Sunken path in centre . .	2 " deep.

The front and back plates both rest on larch poles about four or five feet apart ; a shutter, twelve inches wide, on hinges, forms with a slip of board the front wall. The back wall is made with long faggots of brushwood—a double row : the ends are boarded up, and a door is at each end. Perhaps no gardening structure was ever built so cheaply, and none ever produced such marvelous effects. The trees, dwarf and standard trained peaches and nectarines, two or three years trained, twelve of the former and six of the latter, were planted in February, 1852 ; and this season (1854,) only the third year of their growth, they have given 5,000 *peaches and nectarines.* On one tree of the Noblesse Peach there were 500 peaches, and the same number or more on a tree of the Ebruge Nectarine. This seems enough to ruin the health of the trees, and so I thought when I *heard* of it ; but when I *saw* the excessive vigor of the trees, I thought Mr. White and his gardener not so far wrong in allowing them to bear such an enormous crop. The dwarf trees have reached to the top of the trellis, and cover it so completely, that the standards must be removed this autumn.

Mr. White was, I believe, offered the sum that the house cost him—somewhere about £40—for his crop of peaches and nectarines. The vigor of the trees is quite astonishing ; the stems of some of them are twelve or more inches in circumference ; they are planted inside the front shutter and laid directly on the trellis. The remarkable success of this simple structure seems owing entirely to the perfection of its ventilation ; the front shutter has been open night and day in warm weather, and the air passes gently and constantly through its brushwood back wall, so as entirely to prevent stagnation. The trees have been syringed regularly night and morning, and are in the finest possible health. As this brushwood wall is unsightly and dangerous in some situations, owing to its capability of harboring rats and mice, we must now see what can be substituted for its perfect ventilating property. Hedges to *lean-to* houses, as I know from experience, are too cold to ripen peaches and nectarines, although highly favorable to the growth of the trees ; it therefore appears to me that the perforated bricks, now largely manufactured, could be used with advantage in this way. The wall, eight feet in height, should be built five feet high from the ground with common bricks ; and then, three feet up to the top for the plate to rest on, with perforated bricks placed edgewise ; in very cold weather in March, when the trees are in blossom, a curtain of calico or any other common material, might be arranged so as to cover this space of the perforated wall at night, and in May it may be removed for the summer. This perforated space, with the front shutter constantly open, will, in my opinion, be perfect for a peach trellis, and not unsightly.

It will be seen, from what I have said, that Mr. White's trellis differs from Mr. Ker's in this way—the roof is fixed, and not of removable lights ; the trees are pruned, and the fruit is gathered from underneath, so that all the operations of culture are performed under shelter, and in a climate at all times favorable.—*Rivers' Miniature Fruit Garden.*

Grape Culture.

As public attention at the present time seems to be somewhat enlisted in the culture of the grape, and, as the success is pretty well established in the vicinity of Cincinnati, where it is rapidly extending, a brief sketch of the most approved mode of establishing a vineyard may be acceptable to some of your readers.

The first step, then, is the preparation of the ground. The sides or tops of limestone hills are generally chosen for the location, where the water runs off readily. South and southeastern exposures are the best in this climate. Three modes of preparing the ground are usually adopted here. The first consists merely in deep plowing, with a common plow, as for potatoes, and making the surface fine and mellow with the harrow. The second method goes one step further, and a second furrow is cut in the bottom of the first; in the bottom of the second furrow a sub-soil plow is run, which breaks the ground, altogether, to the depth of sixteen or eighteen inches; it is then harrowed and prepared as in the first. The third method is by thoroughly trenching with the spade to the depth of not less than two feet. If the hill-side is steep (say at an elevation of twenty or thirty degrees with the horizon,) terraces are also raised from two to four feet in height, and extending up the hill from twenty to sixty feet each, according to the acclivity of the surface. By this last mode, the top soil is all thrown into the bottom of the trenches, and the sub-soil, which is generally clayey, thrown upon the top, and left sufficiently smooth for planting. Where stones are found in the soil, they are thrown out on the surface, as the trenching progresses up the hill, and, if in sufficient quantity, are laid up in walls to support the terraces. The terraces are made to run horizontally along the hill-side, or nearly so, with an open ditch for a drain at the upper edge of each terrace, and a similar horizontal ditch as often as once in eighty or a hundred feet, where the ground is not terraced. These drains should lead to the lowest point in the vineyard, where a suitable drain should be constructed down the hill to carry off the surplus water in heavy showers, and may be covered like like a culvert, or left open. In each case the vines are planted in rows, four feet apart if to be worked with the hoe and spade, and from five to six feet if to be worked with the plow or cultivator, and should always run horizontally with the terraces and drains. The distance between the vines in the row varies from two and a half to four feet, according to the mode of training which is to be adopted.

Cuttings of the vine, with three or four eyes, are sometimes planted, at proper distances, in the vineyard; but the usual practice is to plant them first in a nursery, in rows, about eighteen inches apart, and from four to six in a row, to strike root; here they are to be well cultivated, and allowed to grow one or two years, when they are taken up in the spring and planted out in the vineyard. The fourth year from the cuttings (that is, after they have had three summers' growth—two in the nursery, and one in the vineyard), they may be allowed to bear a full crop, or nearly as much as they ever should be allowed to bear thereafter—which is about one-fourth of a peck of grapes to each vine. One acre of ground, planted six feet by three apart, will contain about twenty-four hundred vines; consequently will yield about one hundred and fifty bushels of well assorted grapes, which will make three hundred gallons of wine—sometimes a little more. An acre of good ground, well trenched, and planted with Catawba vines, after it has acquired six or seven years' growth, may be made to yield a much greater quantity; and some small vineyards below Cincinnati, on the hills of the Ohio river, have produced at the rate of eight hundred gallons per acre; but the vines were planted four feet each way, making twenty-six hundred and forty vines to the acre; but the proprietor admitted that his vines were injured by overbearing, and that his wine was inferior in quality when allowed to produce that quantity.

I give three hundred gallons as the full average quantity of wine made to the acre in the neighborhood of Cincinnati. Of course, much variation will depend upon

the manner of establishing a vineyard, and its consequent treatment.

The comparative merits of the different modes of preparing the ground for a vineyard cannot, as yet, be settled by experience in this part of the country, as the oldest vineyard, I believe, has not been established more than twelve or thirteen years. Vineyards planted at Vevay, Indiana, by the Swiss, merely on deeply plowed ground, failed in fifteen years When the ground is plowed eighteen inches deep, it may bear tolerably well for twenty years; but a vineyard planted on ground well trenched two feet deep, and properly drained and cultivated, may be expected to last fifty or one hundred years—prehaps more. The crop, also, is much more certain when the ground is well trenched, not being so liable to suffer from droughts or rainy seasons.

The advantage of deep trenching have become so apparent to those who have had the most experience, that nearly all who can afford it are now preparing their ground in this manner, although done at an expense varying from eighty to one hundred and twenty-five dollars per acre, according to the character of the ground. This, with the addition of twenty-four hundred vines, at sixty dollars per thousand for one year old vines (the customary price in this market), with the cost of planting, will make the expense of one acre, exclusive of land, stakes, etc., at least three hundred dollars, or, without trenching, about two hundred.

S. Mosher.

Plow, Loom, and Anvil.

The Tea Plant in Brazil.—The Consul General of Brazil at New York, has issued a circular which contains the following information respecting the culture of the tea plant:

The cultivation of the plant has gone on for some years in Brazil, but it is only lately that an impetus has been given to it on account of being found to pay well, and by more care and attention in the cultivation and manufacture it may become a vast source of wealth to the country. In 1819, Brazil exported only 53,000 bags of coffee; thirty years after the exports reached 1,700,000 bags, and the cultivation of tea may increase at the same rate."

Profitable Fruit Culture—Sensible Reflections.

The following facts, exhibiting the large profits which may be derived from the skilful culture of fruits, are furnished by S. W. Cole, of Boston, who is a remarkable fact gatherer, and who remarks, "we give some extreme cases, and others which common skill may compass. The cultivator will do well with medial success."

"Mr. Moses Jones, of Brooklyn, in this vicinity, a most skilful cultivator, set 112 apple trees two rods apart, and peach trees between, both ways. The eighth year he had 228 barrels of apple, and, in a few years from setting the trees, $400 worth of peaches in one year; and the best part of the story is that large crops of vegetables were raised on the same land, nearly paying for the manure and labor. The tenth year from setting, many of the apple trees produced four or five barrels each, the land still yielding good crops of vegetables, the peach trees having mostly gone by old age. Mr. J. grafted a tolerably large pear tree to the Bartlett, and the third year it produced $30 worth.

"Mr. S. Dudley, a very successful cultivator in Roxbury, an adjoining city, sold the crop of currants from one-eighth of an acre for $108, the next year for $125, and he had good crops for several years. He picked 500 quart boxes from one-eighth of an acre the next season after setting the bushes in the fall. He had $25 worth of cherries from one Mazzard tree.

"We saw, in Natick, Mass., on the banks of the 'Classic Charles,' on the farm of M. Eames, Esq., an apple tree grafted to the Porter, when 75 years old; it soon bore, and the seventh year it produced 15 barrels, which sold at $30. The original Hurlbut apple tree produced 40 bushels in one year and 20 the next. The original Bars apple yielded 60 bushels in one year. N. Wyeth, Esq., Cambridge, in this region, had from a Harvard pear tree 9 barrels of fruit, which sold for $45.

"A farmer would not plant an orchard, thinking he should not live to eat the fruit; his son had the same views; but the grandson planted for posterity, yet his predecessors shared in the fruit also, for the grandfather drank hogsheads of the cider.

"Hovey states that a Dix pear tree, in Cambridge, produced $46 worth of fruit at one crop. We saw in Orange, New Jersey, 100 bushels of apples on a Harrison tree, which would make ten barrels of cider, then selling at $10 a barrel in New York.

"Downing says that the original Dubois Early Golden Apricot produced $45 worth in 1844, $50 in 1845, and $90 in 1846. A

correspondent of the Horticulturist says that Mr. Hill Pennell, Darby, Pa., has a grape vine that has produced 75 bushels yearly, which sell at $1 a bushel. James Laws, Philadelphia, has a Washington plum that yields 6 bushels a year that would sell for $60. Judge Linn, of Carlisle, Pa., has two Apricot trees that yielded 5 bushels each, worth $120. Mr. Hugh Hatch, of Camden, N. J., has four apple trees that produced 140 bushels, 90 bushels of which sold at $1 each. In 1844, a tree of the Lady Apple, at Fishkill Landing, New York, yielded 15 barrels that sold for $45."—*New York Cultivator.*

Now, in our belief, the people of Virginia know already, or could quickly learn, as much about raising apples and currants, and pears, and peaches, and apricots, as the people of Massachusetts; but what they need is an equal motive to learn; which motive is to be supplied by an equal market. Did they not already know as well as we, we could easily tell them how to insure good crops of them all. Have not our humble selves been teaching them that for more than thirty years? Besides keeping constantly posted up as to the progress of all that takes place to promote actual improvement in these things in our own country, reading all that is published in books and papers, we have within twelve months paid not less than $200 for foreign works and periodicals on agriculture and horticulture, in all their branches, and in various languages; but we might engage to find, in old volumes of the American Farmer, 25 or 30 years ago, all the requisite information for those who desire to be informed; but what would be the practical benefit, even to the few who are deficient in information? The question is who is to buy their pears, and their currants, and apricots, their cauliflowers, and cabbages, and roses, and lilies, and a thousand things that serve to gratify their wants, and to charm their senses, where abundant and diversified employment serves at once to multiply the wants of men, and to create the ability to indulge in a thousand things too delicate and perishable or too bulky to bear transportation to distant and uncertain markets; along with their three everlasting staples, corn, wheat, and tobacco—tobacco, wheat, and corn—all to be consumed at a distance; and all carrying off every year the very life-blood of the land, and all subject to numerous charges on their way between the producer and the consumer, and always at the cost of the former?

Suppose, in these States, public attention to be turned to the cultivation of fruits and vegetables, where will they find or how persuade men to buy that which they themselves are cultivating for sale? One man may lead a horse to the brook, but a thousand men can't force him to drink when he gets there! Hence it is that being driven ourselves once more to look around for bread, and reflecting how we can make our labors useful to that class to whom we have ever been partial, we have deemed it to be more important duty to teach the landholder, if we can, how he is to secure a market near his land for the produce of his land, rather than how he can increase that produce. Only let him learn how to create the former, and the supply will follow as assuredly as effect follows cause throughout the universe. Let him but force the law maker to establish a policy that will insure adequate return in labor engaged in manufactures; such a policy as will lead to the building of furnaces for smelting all his own iron with his own coal; and mills that will insure demand for his own wool from his own flocks; and coach factories that will create demand for his useless timber; and, in a word, the various manufactories for the production of articles now made abroad; when the land holder has made up his mind to do all this, then, and not till then, will he have customers at hand for his fruits and his vegetables, and his milk and his butter, his beef and his mutton. Then, and not till then, he too may have $125 for the currants of an eighth of an acre, and $45 from the fruit of one pear tree, and 100 bushels of apples from another tree, equal to ten barrels of cider, worth $100, and $90 for the fruit from one Golden Apricot. Reader, we put it to yourself—which do you most desire to be told—how to produce, or how to secure a market where to sell? If in the present condition every farmer in Virginia or Alabama could grow 500 bushels of pears on every tree, or as many of currants on an eighth of an acre, what would he do with them? All would be growers and no buyers! Tell your law givers, then, to insure reward to people qualified for other industries, to come and settle in your State, instead of forever crying "free trade! free trade!"—*Plow, Loom and Anvil.*

Cellular Structure.—The formation of cells from nuclei and their fissiparous division (fissiparous, the part separated lines,) are by some attributed to different electrical currents excited by the chemical actions going on in the cell. Cells are produced with great rapidity, especially in the case of fungi. Lindley calculated that the cells of Bovista zizantia (a fungus) have been produced at the rate of more than 66,000,000 in a minute and Ward noticed a similar occurrence in Phallus impudicus.—*Balfour.*

Choice Culture.

The fruit Committee of the Hamilton County Horticultural Society, upon the specimens upon the tables, presented the following report:

Newtown Pippin.—First-rate; a good keeper, of high flavor, and excellent when ripe (in March), not the most digestible before it is perfectly mature; good for the kitchen at any time during the winter.

White Pippin.—Tree thrifty and productive; fruit delicate, but not high flavored; not known by any book name, but very generally known in southern Ohio and Indiana; season, January.

White Winter Pearmain.—A prolific and good keeping sort, not first-rate in quality, but a safe keeping variety, and a juicy good apple in January and February, often confounded with the *Michael Henry,* from which it is not easily distinguished by the taste; seeds pale brown, while those of the *Michael Henry* are nearly black; its shape is also more conical, hence its synonym—sheep-nose.

Wine Sap.—Second-rate, a good, sound keeper, and very early and prolific bearer. The fruit is valuable for cider, excellent in the kitchen for cooking, though not very highly flavored, nor of a delicate texture. It is considered a fair table apple.

Pennock and Vandervere Pippins.—Both third-rate, and have been condemned as table apples, although they have been very extensively propagated and planted, being very vigorous, large trees, that yield abundant crops. These varieties are disposed to rot, and are fit only for cooking.

Gilpin.—This apple is also known as the *Romanite;* it is only third-rate for the table, having an earthy taste. The trees are very early and prolific bearers; the fruit is remarkably regular and sound, and may be easily preserved until March or April. It has been found to produce a very rich cider.

Rawle's Janet.—This apple is so well known as scarcely to need more than a passing notice. It may well be classed as first-rate. It is very prolific, and should be thinned and well fed to produce choice specimens. Its late blooming has caused it to to be called "Never Fail," as it thus often escapes frosts that have destroyed the blossoms of other sorts, such as the *Yellow Bellefleur.*

Pears.—The Messire Jean is a good winter pear, fruit turbinate, keeps well, juicy, and, when well ripened, melting very sweet, but not very high-flavored—worthy of more general culture.

Easter Beurre.—A first rate winter pear, and will keep a long while. The specimen before us is still green; it has been presented to us recently, in a high state of perfection, and has been well kept until April.

The Fruit-Room.

Notwithstanding all that has been said on the matter, it too frequently happens that many things besides the legitimate occupants of the fruit-room find their way thither: bulbs, seeds, lumber of various kinds, and other litter, all, more or less, are too often crammed into the fruit-room; and as all these things are no doubt useful in their way, we must not be too severe in our censures on those who have no other place to stow away such things, only it is right to call attention to the sacrifice their presence there occasions; for, be it remembered, that a quantity of fruit, bulbs, and roots, deposited all together, are widely different from a like quantity of manufactured goods, wood, or iron; for these last named, being divested of all vitality, do not give off any of those gases or exhalations which contaminate the premises they occupy; not but that certain chemical substances do so, and often to a hurtful extent, but, in a general way, the exhalations from such things are more injurious to animal life than to other manufactured goods in their immediate neighborhood; but such is not the case with vegetable substances when piled together, or brought near each other, and placed under circumstances so as to be compelled to absorb, to a certain extent, each other's impurities; for instance let us take two articles both useful in their way.

Let us suppose that large bunches of Sweet Herbs are either drying in the fruit-room, otherwise, placed there for want of a better place, at the same time some Pears are also ripening for table: now, when the atmosphere is charged with the odor arising from Lavender, Sweet Marjoram, and other strong-smelling plants, it is only fair to

suppose that a delicate fruit like a Peach, or a Pear, just in mellow order for table, should be tainted with it, more or less, and its flavor impaired. I know, to a certainty, that Pears partake largely of the flavor of any substance they may have been packed in, it is only reasonable to suppose that fruit will do the same from the atmosphere that is loaded with impurities of a kind, which, if not in themselves obnoxious and offensive, are certainly at variance with what nature intended, and, consequently, must be fatal to the conservative properties of the fruit, if they do not impart an improper flavor likewise. Now, taking all these things into consideration, it is easy to comprehend the point that ought to be attained. A sweet, well-ventilated atmosphere, such an one as our worthy farm-house dames like to place their milk in,—cool, yet fresh and sweet; for, as milk imbibes any noxious exhalation by which it is surrounded, so, likewise, will fruit, though, perhaps, to a more limited extent; consequently, if the fruit-room could be so contrived as to be out of the reach of such things, so much the better; at all events, do not let it be encumbered with substances likely to create what is not wanted.

Much has of late been said about fruit-rooms, and the proper keeping of fruits; but, after all, much of the best fruit, that finds its way into Covent Garden Market, is kept in a very homely way; heaped up in some shed or out-house. Apples are turned out in March and April, in a condition which those having more ample means have much difficulty to exceed; nevertheless, there is much loss amongst them, and the smaller quantity which private growers usually have to deal with, enables them to keep theirs in a manner wherein they can see and examine the stock daily, in order to see what needs removing. For, as most fruit-rooms are fitted up with shelves, and are sufficiently capacious to hold all the fruit required, without being more than two thick, any decayed one is much easier discovered. But prior to the fruit-room being used, it is proper to say a few words on it, beginning with its construction.

I think it has been already mentioned in this work, that this building should not stand in an open, exposed place, with windows to the south, but, if possible, it would be better to shade it from that side, and render the other as open and well-ventilated as possible, and be sure to have such ventilation at top as will enable all noxious gases to escape as they are generated; apertures at the bottom of the house will also be necessary, so that the room is fed by a continuous influx of good fresh air, and the tainted portion driven off by the same means. This top and bottom ventilation is especially required, and we know of nothing worse than a close-ceiled room, with no apertures for air save the windows mid-way up the side. A fruit-room, to be a good one, ought to have as much ventilation as a place intended for public meetings, as, in fact, a church or chapel. It may, perhaps, be urged that these latter are not in all cases furnished with openings, but then their loftiness is such as is capable of containing a large volume of heated or impure air, which, as those meetings are not always continuous, get emptied of their improper contents, and refilled with fresh, pure atmosphere air before the building is again wanted; but such is not the case with the fruit-room—there the evil is often a continuous one, so that the fruit, or other object inside, gets tainted, either more or less, unless, as above, a stream of cold, fresh air is always pouring in, so as to displace the bad ere it assumes a too vitiated character.

The best keeping fruit-room ever I had, stood behind a high garden wall—its north side being furnished with the two windows and a door, while its ends abutted into other buildings—it was not lofty, but, having a lean-to roof, it was plastered and ceiled inside, the same as the roof, and a ventilation was formed at the highest part by an opening in the aforesaid garden wall, not leading through to the south, but going upward, like a chimney, in fact. Small openings were also made at the bottom of the opposite wall, whereby a large current of cold air was sucked in, which, circulating through the room, finally ascended at the back and out at the top, followed by another current the same way: in this room fruit of all kinds kept well; the fittings were the ordinary shelves all around, and a large table inside, which was also often loaded with things for immediate use; the fittings are of less moment, as every one can arrange them to suit his or her own convenience; the leading principle of how to act, seems more especially called for here.

Much as has been said about the fruit-room, &c., it must also be borne in mind that the seasons are not always alike for rendering the fruit capable of enduring the changes by which it is surrounded; but, in a usual way, it is best to let Pears and Apples remain pretty long on the tree, unless they fall very much, or are, in some other way, in a dangerous condition, for after the first few weeks are over, the packed-away fruit keeps much better than it does at first. Colder weather setting in, and other matters tending to check perspiration, the fruit does not so quickly attain

that period of maturity which is identical with a speedy decay; in fact, it is only one form of the same, and that tendency must, if possible, be arrested.

It is well known that certain fruits give off exhalations different from others, and from each other. *Williams's Bon Cretian* Pear is, perhaps, the most offensive of any, where any considerable quantity of them get mellow together, and assuredly, the strong odor from it cannot do otherwise than hasten all that it is in contact with down the road to destruction; at all events, it would be highly improved to allow it to remain in the same place; other things that are equally strong ought also to be guarded against, and, of course, all decaying fruit, or other matters of that kind, ought to be removed as soon as discovered, and all dirt, &c., cleared away, so that the fruit-room, when furnished with its winter store, may be rendered as decent and healthy as its crowded state will allow; and with a judicious ventilation, and other means, combined with good, well-grown fruit to begin with, a fair share of success may be expected, and the various kinds will no doubt keep as long as their specified term of existence is allotted them, and all premature decay and other destructive tendencies arrested, so that good Apples and Pears. I do not mean those hard, wooden ones, which some late kinds deserve to be called, but if good mellow fruit, said to be in season in January, can be kept until March, it will be much better than the kinds reported as being in season then, while a premature ripening has a contrary injurious effect. J. Robson.

The Cow Tree.

One of the most remarkable phenomena of the vegetable world, is the cow tree, described by Humbolt in the following terms, as growing in the Cordilleras of South America:

"On the barren flank of a rock, grows a tree with dry and leathery-like leaves; its large woody roots can scarcely penetrate into the stony soil. For several months in the year not a single shower moistens its foliage. Its branches appear dead and dried; yet, as soon as the trunk is pierced, there flows from it a sweet and nourishing milk. It is at sunrise, that this vegetable fountain is most abundant. The natives are then to be seen hastening from all quarters, furnished with large bowls to receive the milk, which grows yellow and thickens at the surface. Some empty their bowls under the tree, while others carry home the juice to their children. The milk obtained by incisions made in the trunk is glutinous, tolerably thick, free from all acrimony, and of an agreeable and balmy smell. It was offered to us in the shell of the trituros, or calabash tree. We drank a considerable quantity of it in the evening before we went to bed, and very early in the morning, without experiencing the slightest injurious effect. The vicosity of the milk, alone renders it somewhat disagreeable. The negroes and free laborers drink it, dipping into it their maize or cassava bread." Mr. Lockhart, has subsequently afforded the following additional particulars concerning this tree: "The *Palo de vaca* is a tree of large dimensions. The one that I procured the juice from had a trunk seven feet in diameter, and it was one hundred feet from the root to the first branch. The milk was obtained by making a spiral incision into the bark. The milk is used by the inhabitants wherever it is known. I drank a pint of it without experiencing the least inconvenience. In taste and consistence, it much resembles sweet cream, and possesses an agreeable smell."

Receptacles for Milk.—All the various milky juices reside in the bark and leaves, and are not found in the wood. They are contained in distinct receptacles, and may be extracted by means of incisions chiefly in the upper parts of plants and which do not extend deeper than the bark; otherwise they would be diluted and impoverished by mixing with the ascending sap. M. Berthollet has recorded a remarkable instance of the harmless quality of the sap in the interior of a plant, whose bark is filled with a milky juice of a poisonous nature. He describes the natives of Teneriffe as being in the habit of removing the bark from the *Euphorbia* canariensis, and then sucking the inner portion of the stem, in order to quench their thirst, this part containing a considerable quantity of limpid and non-elaborated sap. The reservoirs which contain the milky juice of the wild lettuce, (Lactuca virosa), are so

remarkably irritable that the slightest touch is sufficient to cause it to be ejected from them with considerable force. When this plant is about to flower, if an insect happens to crawl over the stalk anywhere near its summit, a jet of milk is propelled. In general, plants which secrete these milky juices, love the light; few are found to affect shady situations, and none are aquatics. By cultivation their noxious properties may be greatly subdued.—*Lardner's Ency.*

Nuts and Apples.

Dr. J. A. Warder:—I have read the first and second Nos. of your Review, with much pleasure. The account you published of a cross between the English Walnut and our Butternut is new and interesting. I have planted the Spanish Chestnut but not the English Walnut. Six years ago I bought some of the large Spanish Chestnut, and sowed them in a loose rich soil. Only three grew and they are growing yet. But I find the winter frosts hurt them, so as to injure the wood and they die; but new shoots start up again in the spring. At the same time, I bought several chesnut trees from three to four feet high, of the Spanish sorts. These have grown well and have not been hurt by the frost. Could not the Spanish Chestnut be grafted on to the common Chestnut.

Why is not the Hazel cultivated, perhaps it might be improved and be made as firm a nut as the Filbert. I shall try it at all events. Now that I am upon nuts, I must mention the Ground-nut. In the spring of 1851, I sowed some of these and they grew finely, and if the *moles* had let them alone, they would have produced a quantity of nuts. However, some I sowed in a box filled with earth, grew well, and the seeds ripened.

I see that the *Milam* apple is to be *abandoned,* as not keeping up with the improvements of the age. Perhaps I shall say something about apples at another time.

Yours truly,
J. W. Gilbert.

Chemistry of Nature.

All vegetables, when the principle of life has departed from them, begin spontaneously to be decomposed (to putrify.) The elements which enter into the composition of plants, when left entirely to the disposal of their chemical affinities, have a tendency to separate from each other, and form new compounds, very different from those which compose the living plant. This is termed the "spontaneous decomposition" of vegetables. The substances formed by the new arrangement of the elements of the vegetable, are aerial and colorless; hence the entire disappearance of the vegetable, as if it had been totally annihilated when life ceased to preserve its particles together in the vegetable form. The compounds formed, when the vegetable dies and putrefaction goes on, are, carbonic acid, water, carbonic oxide, and carburetted hydrogen. The two former are the chief results of the decomposition; the two latter are formed more sparingly, and principally when there is not a free supply of oxygen to the substance undergoing decomposition. The carbon and hydrogen of the plant have a constant tendency to unite with oxygen, and form carbonic acid and water. Now, there is never present in the vegetable a sufficient quantity of oxygen to convert all the carbon into carbonic acid, and all the hydrogen into water; hence if there be not a sufficient supply of oxygen to produce these compounds presented from external sources, as from the air, the two other matters are formed, one of which (carbonic oxide) requires a less quantity of carbon than the carbonic acid, while the other (carburetted hydrogen) requires no oxygen. consisting of carbon and hydrogen. In vegetables which decay under water, carburetted hydrogen is abundantly formed; hence arises the gas which is found so plentifully in summer in stagnant water, containing quantities of putrefying vegetables.

The spontaneous decomposition of vegetables goes on most rapidly when they are exposed to the air, kept moist, and preserved at a degree of warmth higher than

the usual temperature of the atmosphere. Putrefaction is retarded or almost prevented if the vegetable be dried, so that its own moisture is expelled, carefully excluded from air and moisture and kept cold. The influence of heat in promoting the decay of vegetables depends upon the repulsive power it possesses, by which it disposes the various elements to assume the gaseous form. Animals and vegetables are frequently found in snow or ice, in a high state of preservation. Such are the changes which go on in the dead plant. That mysterious agent, life, is able, by its peculiar power, to control and overcome the chemical attractions which tend to produce these changes, and retains these elements in that state of combination best adapted for the performance of their proper functions: at the moment, however, in which life ceases to superintend the exercise of these functions, they cease, and the chemical attractions, no longer restrained by the vital principle, obtain full sway. The carbon, hydrogen and oxygen formerly existing in the state of wood, bark, leaves, fruit, or seeds, obey the laws of chemistry, return to the state of carbonic acid, water, or inflammable gas, mix with the earth and atmosphere, afford nutriment to new plants, again form leaves, flowers, and all the beautiful and diversified organs of the vegetable creation—again wither and decay, and return to the soil to supply new generations, and continue the same series of unceasing revolutions.—*Reid's Chem. of Nature.*

Coloring Green Tea.—Large portions of the tea imported under the name of green are made so by throwing into the pans of the last heating of the leaves a mixture of finely powdered *indigo* and *gypsum*, in proportion of three of the former to four of the latter. For every 100 lbs. of green tea used the consumer will swallow from eight to twelve ounces of the latter. But the same persons who will exclaim against the *celestials* for munching rats, cats, and bow-wows will swallow indigo and gypsum, or what is worse, prussic acid or verdigris, both deadly poisons, and which are furnished us outside barbarians, simply because our market demands it, as it did annattoed cheese a few years since.

American Agriculturist.

Colza, or Rape Seed.

As a good thing, like the Lord's Prayer cannot be repeated too often, I again venture to urge on the planting interest of this country, and this section of the U. S. in particular, the expediency of turning their serious attention to the raising of such crops as will prove not only more profitable to them individually than the common crops raised now; but likewise of vast importance in a national point of view. I mean the raising of such crops that are used in the arts and manufactures, and are imported to the amount of several millions per annum, for the North Atlantic States only, and which can be as easily raised here. This will in time become more incumbent and imperative on farmers and planters of the Eastern and South Eastern States to learn and try to raise, as every successive year shows conclusively that these States cannot compete to raise as successfully the cereals or grains with the North Western, Western, and South Western States. I will then repeat, not my prayer, but my admonitions which I begun in 1853-54, pass in review which crops can be cultivated with most success and profit, although a well wisher to his country will not do amiss to offer up his prayers at the same time that my suggestions may be adopted. I will begin, then, by the oleaginous or oil bearing plants, at the head of which stands preeminent the Brassica Oleracæ Campestris.

Rape seed is not only an object of the greatest importance and value, wherever it is raised, for the sake of the seed, but is likewise extremely valuable as green food for cattle and sheep, in the fall or spring, or cured for hay for winter.

The Colza or Rape is a plant which requires by preference a strong soil, although it will come well on good sand or gravelly loams, with careful cultivation.

In Belgium and the northern parts of France, where it is raised in great abundance, it enters into the regular rotation on all good heavy loams, and is thought to be one of the best preparations for wheat, owing to the tillage of the soil, the manure applied for it, and the care taken to keep it clear of weeds: it also comes best after wheat, provided this grain crop has been properly manured, in which case rape seed can be sown without manuring again, and will yield a good crop.

The ground should be ploughed in the fall or spring, and again a short time before sowing, and well manured. Then the seed should be sown very thin in drills, and harrowed in *June* or *July*. As the plants

come up, they should be weeded and thinned out, a foot part. A superior mode is to sow the seed broadcast, on a good rich seed bed, prepared on purpose. When the stubble of any grain crop has been cleared off by the harrow, the land well manured and ploughed to good depth, the plants are brought out, and set out as cabbage plants are. This can be done six or eight weeks after sowing, or the latter end of September, or in October, either by the dibble or by hand, setting them out in every respect like the plants of cabbage, in rows two to two and a half feet wide, and one foot in the row; or to save much time, labor and trouble, they can be put in furrows one foot apart, after the plough, taking care to put them up right in the furrow, and to cover them by the return of the plough, leaving the leaves above ground and after the piece is finished, going over it to dress all plants that might be covered too deep, which can be done by a man walking along the furrows and pressing his foot against the plant, or with the hoe. The intervals between the rows should get a hoeing, or the cultivator run in, or a small plow sent through, to give them an earthing up, killing the weeds at the same time, which should be done as late in the fall as the weather will permit, in November or December. Thus they will remain all winter without injury from the frost.

In spring they should have the cultivator run between them again, and weeded, or another slight earthing given them, which will greatly strengthen the plants.

The quantity of seed to be sown, should be from five to eight pounds per acre, and this should be sown in the bed or in the rows evenly. It is a great advantage, that the cost of the seed is so trifling in proportion to the value of the crop.

It is ready to cut and reap when the upper branches turn brown, which will be in June or July. Be sure not to let it be too ripe, for if the pods be too dry at reaping, they will shed the seed in the field, and cause much loss.

It can be reaped in the same manner as wheat, but the hand fulls should be laid singly and light upon the stubble, behind the reapers, and thus it should lie without stirring, until it is ready to thrash out, which will be in a short time, particularly as generally at that time, the weather is dry and warm.

When it is ready and perfectly dry, prepare a floor in the middle of the field, by levelling the ground, on which should be spread a large muslin cloth, twenty to thirty-feet square; spread the rows round, and thrash round. One man or a boy to spread before the thrasher, and another to turn; or it can be thrashed by a thrashing machine, in this case taking care, if the seed is intended to be thrashed on the barn floor, to remove the plants on a large sheet, spread on the wagon, to prevent loss of seed, by the jolting and shaking of the wagon.

The seed can then be stored in a dry and airy granary until it is sent to be sold or crushed.

The Rape in good ground, well treated, does not fail to make strong stems and succulent leaves, so that by the middle or latter end of November, it will be strong enough to bear pasturing; then turn in the sheep, but take care they do not eat but just the leaves, which they will crop first, not suffering them to touch the stalks, as that would be injurious to the plants. This will form one of the best pastures for your sheep, if you keep any, and will make them fat and in good condition,; or the leaves can be gathered for hogs or cattle, but I do not advise by any means to turn in horned cattle or hogs, for the damage they will do to the stalks. The only safe stock to turn into Rape, in my opinion, being sheep.

The produce of an acre of Rape, will be according to the condition of the land, management and care, from twenty bushels upwards to fifty, which will command from three and a half to four dollars a bushel, in Philadelphia, New York, Boston, or Baltimore. The yield will be materially affected by the care given to it in thrashing it properly. A very full crop will be from fifty to sixty bushels, and upwards of eighty bushels have been and are raised frequently in Flanders.

Great advantage may be derived from cultivating it in the following manner.

Take half an acre of good land, or make it so by manuring, and work it a little better than ordinary land, or as you should your garden. At mid-summer (June or July) sow on this half acre, thirty pounds or two pecks of Rape seed—this will produce a plentiful crop, as few grains will miss; let them grow until the middle of September; take eight or ten acres of wheat or oats, or early corn; plough the stubble, and let it lie a month or six weeks to rot; then plough it again; if the land has been manured previously well, it will thus be in a good condition.

Begin at one side, plough a furrow, set the plants in the furrow, at the distance of a foot, leaning against the side of the furrow; set the plough and make another furrow, at two feet distant from the first, and in returning it will cover the first furrow planted, and continue so until the whole field is set.

Insects.

For some reason agricultural entomology is less understood than almost any other branch of rural knowledge. This general neglect of an important science is, doubtless, one cause of the alarming increase of destructive insects in many parts of the country. Let the subject be fully and critically investigated, and the result will show that man unwittingly destroys thousands of birds which Providence intended to subsist on insects, and keep their larva from devouring the farmer's wheat and other grain, and the gardener's vegetables and fruits. If we study Nature's laws we shall discover the important fact that no great class of animals or plants can be exterminated without inflicting severe and irreparable damage on the human family. Even insects perform important functions in the economy and exact balance of organic nature. Subsisting mostly on vegetable substances, they check the strong tendency, in many districts and countries, to the over-production of plants. If there were no insects and no birds, the existing relations between the animal and vegetable kingdoms could not endure a year. The order of nature would be broken up, and the growth of forests and grasses would extend out of all proportion, as compared with the graminivorous and carnivorous mammalia. The change might not arrest public attention at first, but soon the new order of things would indicate the usefulness and necessity of both insects and birds. These were created because the plan of the Creator would be incomplete without them.

If this feebly expressed view of created beings be sound, man cannot nearly exterminate the birds of a country and not, in effect, augment indefinitely all the insects that prey upon his crops, and greatly annoy his domestic animals. We wish to lay the axe at the root of the tree, and show that natural laws demand the multiplication of the beautiful feathered tribes, whose music has a deeper meaning as the voice of the Invisible than man with his murderous guns has yet dreamed of.

Suppose the State of New York had a thousand robins where it now has one, how many caterpillars, moths, worms, grubs, and other voracious insects would these birds consume? If public opinion were only enlightened on this subject, so as to protect all insectivorous birds, we should soon cease to complain of curculios, weevils, peach tree and apple tree borers, pea-bugs, and a hundred garden bugs, flies, snails, grasshoppers, locusts, cotton, and tobacco worms. We have had opportunities for studying most of these depredators, and regard the unnatural destruction of birds, or their expulsion from all so-called civilized communities, as the principal cause of the increase of insects. The re-productive powers of these are incredible to one who has paid no attention to entomology. There is not an animal or a plant known to science upon which no insect subsists. The larva of musketoes consume myriads of infusoria that grow in stagnant water. The millions of "wigglers" that may be seen in reservoirs of rain water, grow and wax fat on something more substantial than air or pure water. By consuming the organized elements in which decay has already commenced, insects often purify water and the atmosphere. The young of a common flesh-fly adds 200 fold to its weight in 24 hours. This can only be done by the enormous consumption of very nutritious food. Imagine an ox that weighs 1,000 lbs. adding 199,000 lbs. to his weight in a day or a year?

If it were not for the fact that insects destroy one another, and thus keep down their numbers, they might, perhaps, entirely exterminate all other living things, and die from starvation, leaving not a plant or animal on the globe. Among all the 100,000 different plants, and 200,000 or 300,000 different animals, how wonderful that no family of either obtains the mastery, and rules supreme! Plants and animals maintain a perfect republic; the balance of power between them all is complete. Man, by his superior endowments, is able to disturb this comprehensive and delicate balance more than any other order of beings; and he can never fulfil his high destiny until he studies, comprehends, and obeys the laws of his Maker. To this standard our agricultural and horticultural knowledge and practice must rise before we have a right to expect complete success. Let us, then, study Nature and observe how nearly all the feathered tribes, with which we are familiar, hatch their young at that season of the year when insects and their larva most abound, when so many millions are daily consumed to feed the voracious broods of rapidly growing birds. In Maryland and Virginia large flocks of turkeys are reared expressly to be driven through tobacco fields by children "to worm the crop." A turkey, from the time it is large enough to eat a worm till it attains its full growth, will consume an incredible number of insects, and forcibly illustrates an important law. Barn-yard fowls, doves, and pigeons may also be cultivated at a profit. Of all the works written on poultry, we have never seen one that treated the subject in a truly scientific and philosophic spirit. When an adult turkey eats 100 ounces of dry corn, what will the excre-

ments formed by this corn weigh after they are dried? Who has investigated this matter?

In their relations to agriculture, both ornithology and entomology are much less understood than many suppose. The learned and scientific men who have cultivated these departments of natural history, have been unacquainted with agriculture and their language is too classical and little known for their books to be much read by farmers.—*Gen. Farmer.*

Shading Bees.

I read the theory and the various reports of practical experience of the numerous correspondence to your instructive periodical, on the cultivation of bees, with much interest and advantage. I have, for some years, devoted my attention to the subject. My object is amusement, accompanied by a desire to ascertain whether these busy little insects can or cannot be made a source of profit to the industrial classes; and on that I confess I am still undecided. I hope, however, yet further to develop the subject myself, and to witness its development by others; and to effect this I know of no better plan than by the experimentors recounting their experience in your paper;—thanks to you for opening your pages for the purpose. My object in this communication is to tell your correspondent, "An Old Bee Master," that his plan of placing hives in situations entirely or nearly, removed from the influence of the sun's rays, will not *invariably* prove successful. One of the greatest annoyances that I have experienced as a bee cultivator, arose from trying his plan two years ago. I placed a powerful young hive under a fir tree, densely covered with ivy; indeed so sheltered and dry was the situation, that during the heaviest storm the rain never moistened the covering.

The bees had an excellent and uninterrupted success. They worked well, and they labored as hard as any hive in my collection; but alas! they lost their labor, and they perished in the attempt. Daily, during the months of March and April, I found hundreds lying on the ground, under and round about the hive, and even on the board with the products of their exertions, but physically unable to convey it to its destination. It appeared to me that the moment they left the direct influence of the sun they became paralyzed. I daily collected them together, and by means of a butter-boat literally *poured* them into the hive through a hole cut in the top, by which means, doubtless, many thousands of lives were saved. I could not endure to witness my little favorites thus "wither, waste, and die," and therefore I restored them to their beloved sunshine, and there they prospered, and before the end of the summer furnished me with a fine swarm. I am convinced that I should have lost my hive had I allowed them to remain in their cheerless and sunless position. Their powers of endurance are unquestionably very great; but there is a limit beyond which nothing can extend. Do not suppose me to call in question your valuable correspondent's communication, or to deny his facts. I merely desire to show from experience that a sunless aspect will not hold good under all circumstances, in all situations, and in all seasons. It may be that an "Old Bee Master" is warmly located in the south of the Island; my habitation is not so favored: I reside in the county of Nottingham. I would suggest that the total seclusion from sun be tried with great care and caution, if tried at all; and particularly that the ground around be closely examined for bees unable to land at home. Let them be collected together by means of a feather and put into the hive. I will not trespass further on your space; now if you are not full of correspondents on this subject, and deem this letter worthy of a place in your paper, I shall have much pleasure in occasionally *conversing* with my brother bee growers, through the medium of the Cottage Gardener.—*Cot. Gard.*

ONE THOUSAND DOLLARS FOR A CAMELIA.—The beautiful seedling camelia, raised by Peter Mackenzie, Spruce street, Philadelphia, named "Jenny Lind," has been sold to Messrs. Henderson & Son, of London, for two hundred pounds, or one thousand dollars, and will be shipped in the steamer City of Manchester, on her next voyage.

Analyses.

The following are Dr. Emmon's exact analyses of—

ASH OF THE PEAR.

	Sap-wood.	Bark.
Potash	22.25	6.20
Soda	1.84	
Chlorine	0.31	1.70
Sulphuric acid	0.50	1.80
Phosphate of lime	27.22	6.50
Phosphate of peroxide of iron	0.31	
Carbonic acid	27.69	37.29
Lime	12.64	30.36
Magnesia	3 00	9.40
Silica	0 30	0.40
Coal	0.17	0.65
Organic matter	4.02	4.20
	180.25	98.30

ASH OF THE APPLE.

	Sap-wood.	Bark.
Potash	16.19	4.930
Soda	3.11	3.285
Chloride of sodium	0.42	0.540
Sulphate of lime	0.05	0.637
Phosphate of peroxide of iron	0.80	0.375
Phosphate of lime	17.50	2.425
Phosphate of magnesia	0.20	
Carbonic acid	29.10	44.830
Lime	18.63	51.578
Magnesia	8.40	0.150
Silica	0.85	0.200
Soluble silica	0.80	0 400
Organic matter	4.60	2.100
	100.65	109 450

COMMON WILD GRAPE-VINE.

	Wood.	Bark.
Potash	20.84	1.77
Soda	2.06	0.27
Chlorine	0.02	0.40
Sulphuric acid	0.23	trace.
Phosphate of lime	15.40	5.04
Phosphate of peroxide of iron	1.20	5.04
Carbonic acid	34.83	32.22
Lime	17.33	39.32
Magnesia	4.40	0.80
Silex	2.80	14.00
Soluble silica	...	0.30
Coal and organic matter	2.20	1.30
	100.21	100.86

COLORS OF FLOWERS.—Those of the common pink Phlox are light blue early in the morning, and afterwards bright pink, as the sun advances. Those of the Œnothera tetra flora are white in the morning and red at noon. Hibiscus variabilis, flowers white in the morning, pink at noon and red at sunset. The bracts of Hakea Victoria are yellowish white the first year in the centre; in the second year, a rich golden color; the third year, a rich orange; the fourth year, a blood red; the green portion of the bracts become annually darker.

Asparagus.

The best way to grow Asparagus is a "question" with the journals just now. I infer the subject interests. I beg to offer a sketch of my practice.

In the matter of *soil* I am not over particular. I only care to avoid extremes of wet or dry. The best is probably a light sandy loam in cool situation, but *not wet*.—A strong loam on a bed of brick clay is little inferior. Whatever soil be adopted, a foot in depth of half rotten stable manure should be laid on the surface, and the ground trenched up or loosened at least two feet deep, the manure being thoroughly mixed with it. Early in spring, having a stock of three or strong two year old plants at hand, prepare for planting by marking off for beds parallel lines of four feet, with two feet between each bed for alleys. In these beds set the plants nine inches from each other in two rows, commencing one foot from the edge of the bed, only just covering the roots with soil. This will give two feet between the rows in the beds, more than is usually allowed; but my object is to grow it *well*. After the planting is finished, lay a two inch covering of stable manure over the beds, and take the soil from alleys three inches deep and throw over the manure.

I differ with most writers in the after treatment of my beds. I cut the second year from planting, but do not take off "all I can get till the middle of June, then leaving and encouraging all the rest to grow." I leave all I can spare of the earliest shoots; and, after it has been a month or so in season, cut off all that comes afterwards, provided I have enough shoots in that time to cover the bed without crowding. The shoots of this season have to form the buds of the next; the more time afforded them to grow, and the less they are crowded, the finer in proportion will the shoots from the eyes be. Attention to this will obviate the necessity of "plucking of flowers or young fruit as fast as they appear;" a recommendation which will probably share the fate of a similar one made to "pluck off potatoe blossoms" a few years ago. In the winter treatment of my beds I also have my own notions. As soon as the stalks are ripe they are cut off; the soil raked from over the roots into the alleys till the crowns of the roots are nearly visible, when I place on the beds a layer of manure two inches in thickness, and the soil in the alleys is replaced over this in the spring. This I practice every season, and by it any one without any pretensions to chemical knowledge may have, in any common garden ground, asparagus.

in abundance, averaging each stalk 2½ or 3 inches in circumference, which I think any reasonable man ought to be pleased with. Salt is an excellent manure for it in dry, sandy soils; others it renders wet, stiff, cold, and miserable, in which we might as well try to grow cantaloupes as asparagus. There are tons of salt thrown away every year on asparagus.

THOMAS MEEHAN, in Farm Journal.

If one of our leading market gardeners would, for one season, adopt the English plan of cultivating and cutting this vegetable, and supply his customers with it, the white, bitter, stringy trash now so common in our markets would find no buyers.

A late number of the London Gardeners' Chronicle very clearly alludes to the main points on which successful management depends:

1st. Abundance of manure applied at the proper time.

2d. Preservation of the stems and leaves during the whole season of growth, and, if possible, the prevention of seeding.

3d. Not to cut until the roots have become large and strong and then cut the same beds only every other year.

4th. To keep the roots near the surface in order to give them full benefit of atmospheric heat, that the growth may be strong and rapid and therefore green, succulent, and melting.

We extract as follows from the article referred to:

The grower of this vegetable ought to recollect that the two points of excellence in it are first size, and sound succulence. It should be thick as the thumb and brittle as glass. To secure this result two things are indispensable; it must be produced by very vigorous plants, and it must grow very fast. These two cardinal points must be considered separately.

Its vigor will depend upon the soil in which it grows, the quantity of manure it receives, and its general treatment. The long, stout, succulent fangs, or roots, of an asparagus are so tender that they will not form freely in soil which offers much resistance.

The natural asparagus is never large; on the contrary, it is more like what is technically called "sprue." The cause of that is, we presume, to be sought in the want on the sea shore of the powerful manure on which it greedily feeds, when it can obtain it. The wild asparagus has all that it requires for mere health; but it is ill fed; it differs from the fine garden plant just as lean kine differ from fat bullocks. Feeding makes all, or great part of the difference. Experience shows that no manure is too strong for this plant; its great spongy roots can take up any quantity with advantage, if applied at the right season. That season is after it has begun to move in the spring; applied at any other time the fat, oozy slime which it loves, is absorbed without being assimilated, and soon produces a fatal rot in the roots. Beside this, the plant must be cherished during summer while not under the knife, for it is only thus that its vital powers can be much increased. No exuberance of growth in the asparagus stems can be regarded as excessive; nothing should be done to check it.

All precautions will, however, fail if the asparagus is called upon to bear a crop before it is old enough. Early bearing ruins plants as much as animals, and inevitably brings on premature debility. The older it is before the cutting begins, the stronger, other circumstances being equal, will it be found.

The asparagus being brought to the requisite state of vigor, the next question is how to secure the necessary succulence, which it never has beyond two or three inches in an English market, and not often anywhere else. That succulence will depend upon temperature as much as other causes. The warmer the asparagus bed is kept while the sprouts are rising, the more brittle they will be, provided the temperature of the soil does not rise above 75 deg. at the most.

DISEASE AMONG NUT OR STONE FRUIT.—Last year Mons. Geville pointed out this malady, and this year shows its attacks on our cherries. Those of many gardens, after having blossomed well and formed their fruit apparently in a sound condition, were all at once killed, either partially or completely, at the moment when the nut or pit was being formed. On examining the branches we found the pith turned black, with a sort of vegetable gangrene. Prunes, also, were partially attacked in the environs of Paris, same as the cherries. At Montreuil, many peaches were destroyed in the same way.—*Rev. Hort.*

TIME OF MATURING AND RIPENING IN SOME PLANTS AND FRUITS.—Grasses from 13 to 45 days. Raspberry, Strawberry, Cherry, &c., 2 months. Roses, Whitethorn and Horse Chestnut, 4 months. Vine, Pear, Apple, Walnut, Beech, Plum, Nut, Almond, 5 to 6 months. Olive, 7 months.

Curculio.—A Jim-Crack.

The following appeared in an Eastern paper—most cultivators of plums would probably, like Franklin, like to know the cost of the *whistle*.

The Curculio.—Among the numerous applications for the protection of the plum and other fruit trees from the ravages of this pomological pest, none seem to have proved effectual but shaking the trees night and morning, for many days, and collecting the insects upon clothes for destruction. This is so laborious, and requires such unremitting attention, that none but the most enthusiastic and persevering fruit growers will adopt it.

An ingenious amateur cultivator in this city has contrived a machine, by which his trees are subjected to a smart concussion every five minutes, night and day, during the season in which the curculio deposits its eggs in the fruit. This has proved entirely successful, and from trees that once set an abundance of fruit which never matured, he now gathers an ample supply for his own family, with a surplus for his friends.

As this contrivance is not expensive, and may be modified to suit the wants of the small cultivator, as well as those who raise plums for the market, a brief description of it may be acceptable to some of our readers. The motive power, by which this machine is operated, is a small stream of water from a cistern in the upper loft of a building contiguous to the trees. The water is conveyed to this cistern by a forcing pump worked by a small windmill, and as it is received into a cistern upon the lower floor, it is retransferred by a pump, and thus kept in constant circulation. In its descent from the upper to the lower vessel, it falls upon an over-shot bucket wheel, made of tin, three feet in diameter and three inches wide, which drives a train of wheels ending in a small gear that revolves once in five minutes. This gear works into a rack that has two adjacent teeth filed off, so as to allow the rack, at each revolution, suddenly to slip back. To the rack wires are attached, and led thence and connected with the hammers leaning against the plum trees. By the slow forward motion of the rack, the hammers are raised until the gear reaches the point of the missing teeth, when it is suddenly drawn forward by the descending weight of the hammers, which fall upon the trees with sufficient force to dislodge or frighten away every insect. The hammers are made of blocks of wood, twelve inches in length, and three in diameter, with long handles inserted like a common beetle. The handles are fastened by a hinge to posts driven into the ground, and inclined at an angle of about 25 degrees from the perpendicular. The blow is received upon the stump of a limb sawed off within six inches of the boll.

The cost of the whole affair was thirty dollars, and the gentleman who devised it is of opinion that a small plum orchard, say of 50 or 100 trees, might be effectually protected from insect depredators, by an apparatus, the first cost of which would not exceed one hundred dollars.

The Advent of the Locusts.—Dr. G. B. Smith, of Baltimore, who is generally well informed on the subject, announces that the seventeen years' locusts will appear this year on the whole of the eastern and western shores of Maryland, commencing about five miles from Baltimore, and extending to Carlisle, Pa. They will appear, also, all over Maryland, in very small numbers. They will also appear in Kanawha county, Va., and in this State about Lexington, Frankfort, Flemingsburgh, and extending to Meigs and Gallia counties, Ohio. In Massachusetts, about Barnstable, and adjacent towns, he says they will likewise appear. Dr. Smith adds: They can be found in all the above places, wherever trees, shrubbery or forests grew in 1838, by digging down one or two feet. They will be found in their cells, inside of lumps of earth of the size of the fist or larger; and when these are broken, by the spade or otherwise, the cells will be exposed, and the locust grubs in them, one in each cell.

Ivy on Buildings.—It is a mistaken idea that ivy renders a structure damp, and hastens its decay. On the contrary, nothing so effectually keeps the building dry, as may be seen by examining beneath the ivy after rain, though everything around is deluged with wet. Its exuberant and web-like roots, issuing as they do from every portion of the branches, and running all over the surface on which it grows, bind everything together that comes within their reach with such a firm and intricate lace work, that not a single stone can be removed from its position without first tearing away its protecting safeguard. In proof of this, we refer to ruins of ancient castles and buildings; for, while in those parts of the structure that have not the advantage of this protection, all has gone to utter decay; where the ivy has thrown its preserving mantle, everything is comparatively perfect and fresh, and oftentimes the very angles of the sculptured stone are found to be almost as sharp and entire as when first they came from the hand of the builder.—*Am. Ag.*

Manures.

"Fixing agents in connection with liquid manure.—While I consider the addition of certain chemical fixing agents to the mass of yard manure as unnecessary, still their use in connection with the drainings, the liquid yard manure, is to be highly recommended; for in this case the whole of the added substance can be directly applied to the definite object of retaining vapors of ammonia, and therefore the process is not an expensive one; since a relatively small amount of fixing material is sufficient to prevent the escape of ammonia from a large quantity of the liquid, and also to fix the ammonia of the solid manure, so soon as the latter is drenched with the former. The mixture must of course be made in the reservoir which collects the drainings; and which may occupy a separate accessible position, or may be placed in the midst of, and covered by the manure. Especially in the latter case, care must be taken that the fixing agent employed be such as does not occasion the separation of quantities of solid matter, which might easily stop up the pumps.

In practice three substances are especially employed as fixing material, viz.: gypsum (or plaster of Paris,) green vitriol, and sulphuric acid. The two former cause the separation in the tanks of a more or less considerable sediment which, in case of gypsum, consists mostly of carbonate of lime, or when green vitriol is employed, of a mixture of oxyd of iron and sulphuret of iron. The lime sediment, together with the liquid, which contains all the ammonia, dissolved in the form of sulphate of ammonia, may be applied directly to crops, and especially to meadows, with the greatest advantage. The iron sediment formed when green vitriol is used is also a good fertilizer; but may at first act injuriously from containing the sulphuret of iron, which when exposed to the air becomes again poisonous green vitriol, (protosulphate of iron) that is destructive to young plants. By long and thorough exposure to the air, however, another body (persulphate of iron) is formed, which is innoxious. Green vitriol has long been used as a fixing agent in Switzerland, and in some parts of Belgium, while in England sulphuric acid is preferred, and the latter must always be employed where the separation of sediment is to be avoided.

A well known English farmer who has made many experiments upon the use of sulphuric acid, obtained the best results when he added 1 lb. sulphuric acid to 150 lbs. of tank liquid, (1 lb. to 20 gallons, nearly.) He also found that in comparing the effects of the two equal quantities of tank liquid, one treated with sul. acid, and the other applied in its usual state, that in case of the former an expenditure of $10 gave a hay increase of $65 value. A similar if not so great advantage may of course be expected in case of all crops to which liquid manure is applied.

The extent to which ammonia may be lost when common liquid manure (i. e. liquid which has not been mixed with a fixing agent) is spread out upon a large surface, as when it is applied from the watering cart to a growing crop, thereby evaporating with great rapidity, is made evident by an experiment of D. Krutzsek who found that the solid residue remaining after the evaporation of perfectly putrid yard liquid, contained 3½ per ct. ammonia; while the same liquid, treated with an acid (fixed) before evaporation, gave a residue containing 12½ per ct. of ammonia. According to the estimate above given, the liquid manure yielded by each cow during a year, requires about 23 lbs. of sulphuric acid to fix its ammonia—if it be assumed, by way of example, that 2-3 of the urine is absorbed by the straw or litter and thus becomes a part of the solid manure, while the other ⅓ finds its way to the tank. To a pailful of tank liquor, may be reckoned ⅓—½ lb. of sul. acid, and when the solid contents of the cistern are known, it is easy to calculate the total amount of acid required to be added from time to time, every week, for example. In case the whole of the contents of the cistern are applied to maintain the solid manure in a proper state of moisture, or preparation of compost, thus not being brought into direct contact with the crops, it is advisable to add yearly to the tank about 20—25 lbs. of acid for each head of cattle. The outlay cannot fail to be well repaid, though it must be confessed that the advantages of the last case are not so remarkable, as when the liquid manure is applied as such directly to the crops; and this not because the action of the acid is not as perfect in one case as in the other, but for the reason that when yard manure and composts are skilfully prepared, the loss of ammonia is very slight, even without the use of fixing agents. I therefore recommend before making any great outlay for fixing materials to be used in the improvement of *solid yard manure or compost*, to determine by accurate experiment on the small scale, what is the money profit resulting from their application, and thus ascertain if their use will pay; but when the *yard drainings* are to be applied directly to the crops, one can trust that the use of sulphuric acid

in the proportions mentioned will yield most ample profit, will in fact, under favorable circumstances as to weather, &c., repay the outlay three to six-fold. It should be added that muriatic acid (spirit of salt, hydrochloric acid) may be used with the same results as sulphuric acid whenever it is cheaply obtainable.

Treatment of Horse-dung.—The use of fixing agents has proved to be especially advantagous with such manures as are very rich in compounds of nitrogen. Of such character is the urine of the horse, and when horse dung, itself so heating, is to be moistened and brought to a proper state of decay, by drenching it with the liquids that have drained from it, the employment of chemical means for retaining ammonia is most necessary.

In places where large quantities of horse-dung accumulate, which must often lie several months, exposed perhaps to the summer heats, before it can be brought into use—the method proposed and carried into practice by Schattenmann, will be found very useful, if it is desired to preserve the qualities of the manure a long time unimpaired. Such a preservation can only be effected by artificially retarding the fermentation, which in case of horse dung, may go on, as is well known, with such energy and rapidity as to cause even a spontaneous combustion of the mass.—Schattenmann seeks to hinder the fermentation not only by letting all the liquids of the manure run into a capacious cistern, but he drenches the first dung, especially in hot weather, with considerable quantities of water, and collects the washings in the same cistern with the first drainings. By this procedure the dung is, on the one hand, saturated with moisture; and on the other hand, fermentable substances are dissolved out and removed, thus in a double manner hindering the too rapid progress of the decay that soon supersedes.

This treatment is improved upon by adding green vitirol; or where this is costly, dilute sulphuric acid or even plaster of paris to the collected liquids, in quantity sufficient to fix their ammonia, which may then be used to drench repeatedly the solid portions, as has been before written of, in connection with the management of common yard manure.

The urine of the horse evolves during its putrefaction considerable quantities of sulphuretted hydrogen; to prevent its unpleasant odor, it is well to use a few pounds of green vitrioi in all cases, even when gypsum or sulphuric acid is depended upon as the chief fixing agent.

Finally the manure of sheep may be treated as has been recommended for horse manure, especially when it accumulates in the yard during the summer in considerable quantity, and does not remain in the stable under the animals.

Peat coal as a fixing agent.—Experiments have been made in Saxony with peat coal, which fully demonstrate its value as a means of retaining the virtues of liquid manure. By its use not only is the volatile ammonia held back, as when gypsum, sul. acid &c., are employed, but it is carried into a less soluble combination whereby its leaching into the subsoil is hindered. Doubtless on many light soils, no inconsiderable share of the ammonia contained in liquid manure which has been treated with the other mentioned fixing agents, is lost by the action of rains. Beside this advantage, the coal has, as is well known, the faculty of absorbing any vapors of ammonia that may be floating in the air, or that are brought down in rains and dews.

Finally the porous coal acts upon many soluble mineral salts, especially upon those containing potash in an analogous manner, though not in so high a degree. It renders them less soluble, and therefore are more durable in their action, as they remain a longer time in the vicinity of the roots and plants.

These properties are possessed in the highest degree by the exceedingly porous wood-charcoal: this is however too dear in Germany to be used on the large scale.

Peat or turf coal acts more favorably as a fixer, according as the original peat or turf from which it is prepared, is more of a light and woody nature and less mingled with sand and earth.—*Country Gent.*

Rural Conveniences.

We do not allude to the common, slipshod, and imperfect way in which these supplies are obtained; that is, by means of late and stunted vegetables in a weedy and unmanured garden, or fruit of a doubtful character, on neglected, moss-grown, unpruned trees, and everything else of a similar style of production. These cannot be called luxuries, and even the inhabitant of dense cities, who sees only brick walls, and one small patch of clear sky just overhead, may get much better at the nearest market, or the corner of the next street.

What we allude to, are articles of much higher perfection—the best early vegetables from the hot bed; the most delicious raised in the open garden; fruits of the most improved varieties, under the best cultivation, and comprising the whole yearly circle, from the earliest strawberries and cherries, through the profusion of sorts that

ripen in summer and autumn, to the finest long-keeping apples and pears. Every one, almost, has plenty of fruit during a certain brief period in autumn, and some have a partial or occasional supply through a large portion of the year; but very few are able to place a fine dish of the best upon their tables for every day of the year.

The animals of the farm contribute their share; "the flowing cup, fresh from the dairy virgin's liberal hand," as Armstrong expresses it; real genuine cream for the strawberries, and not the market mixture of chalk and milk; a fowl for the table, when needed, and plenty of fresh eggs from the poultry house at all times; these all contribute much to the comfort of country life. But these are not all; the neat residence, the well-furnished rooms, the intellectual food of books and papers, all have a large share in making up the complete whole.

But while the country resident is providing for his own convenience, he should not forget the comfort of his domestic animals. It is always gratifying to see the same complete system of convenience in a farmery, as in the most perfect and best kept family residence. Warm, well ventilated, well littered stables, thoroughly cleaned at least twice, but better three times a day, are not so rare as ample provision for the smaller animals. All animals are most liable to disease, and most subject to a loss of flesh, when suffering from any kind of discomfort, among the most prominent of which are badly-cleaned floors and an impure atmosphere. Good milk is not to be expected, nor good butter to be made from cows suffering under these unfavorable influences.

A very rare thing is a clean, inoffensive piggery. Every pig-house should have a smooth, hard floor, so as to be constantly scraped and swept, by the easiest possible removal of the accumulation. Where several inches of peat or turf are deposited for them to root or to burrow in (when the weather is not freezing), this should never be allowed to remain long enough to create an unpleasant odor, and a hard floor will contribute much towards its easy removal. How much better would be such special provision as this than the more common practice of allowing swine to roam the barnyard among cattle, seeking shelter and cleanliness, but finding none.

Fowls are very sensitive to cold and discomfort. We have examined many well-made poultry-houses, but scarcely one kept constantly sweet and clean. It costs but little more to remove a peck of hen guano, in light, semi-daily instalments, than at one weekly and disagreeable operation. Sheep would grow and thrive, and survive our winters enough better to pay for artificial shelter in a year or two, if comfortable sheds and dry yards were provided for them, and sufficient divisions made for keeping the various classes of weak and strong, young and old, separate.

Complete ranges of buildings to furnish ample provision for all these purposes should be regarded as a *sine qua non* of every good farm; and if the tools and implements, also, could be only regarded as having some degree of sensation, perhaps better care would be taken, and better shelter be provided for them. Carts, wagons, and plows; rakes, hoes, and forks; harrows, cultivators, and drills, should as much have special rooms provided for them, in which they should be carefully kept when not in use, as the favorite horse.

There is one other room of a different character, which should never be omitted on any farm of considerable size, but of which nearly every one is entirely destitute. This is a business office, attached to the dwelling, where the account books are kept, where hired men are settled with and paid, where bargains are made with business men, and all consultations of a business character are held. Such a room need not be more than ten or twelve feet square, and may be of very simple construction, warmed by a small stove, and not consuming a cord of wood in a year. If the farmer does not himself see the advantage of such an office, every neat house-wife most certainly will, who is so often annoyed by such transactions in those singularly appropriate places, the parlor, or around the kitchen cook-stove.

We might add to the list of conveniences, good, well-graveled farm roads; well-paved or flagged barn yards; and self-shutting and self-fastening gates for the different fields. COUNTRY GENTLEMAN.

Potatoes Grown in Tan.

BY WILLIAM SUTTON, SALEM, MASS.

MR. EDITOR:—In compliance with your request, I forward the following facts, relating to my experiment in the cultivation of potatoes. Had I anticipated anything like the result that followed, I should have noted the facts with more particularity.

In 1850, the ground was planted with corn and potatoes. Part of the potatoes rotted. This year it was laid out into squares, fourteen paces each way. A small coating of barn manure was spread, after plowing, and harrowed in.

Lot No. 1.—The potatoes were covered with salt hay, about six inches thick, over the whole square. Yielded four bushels.

Lot No. 2.—The potatoes were covered

with slacked lime, then covered with soil, then spread half a bushel of salt over the square. Yielded four bushels.

Lot No. 3.—The potatoes were covered with soil, then a coating of lime on top. Yielded four and a quarter bushels.

Lot No. 4.—The potatoes were placed in the hills on the lime, and then covered with soil. Yielded four and a quarter bushels.

Lot No. 5.—First put a shovel full of tan in the hill, then the potatoes on the tan, and covered with soil. Yielded four and three quarter bushels.

Lot No. 6.—Put a shovel full of barn manure from the stall where my oxen were kept, and covered with soil. Yielded four bushels—the poorest lot in the field.

Lot No. 7.—Dropped the potatoes, and threw a shovel full of tan upon them, and then covered with soil. Yielded four and a half bushels.

Lot No. 8.—Dropped the potatoes, and threw a shovel full of meadow mud upon them, then covered with soil. Yielded four bushels.

Lot No. 9.—The same as No. 8, with the potatoes dropped in the mud. Yielded four bushels.

The potatoes in Nos. 5 and 7 were up a week before the others.

In most of the parcels, except where the tan was used, there were found more or less of defective potatoes. Those that grew in tan were larger, smoother, and of better quality than the others. I have grown no better potatoes than these this season. I am so well pleased with the operation of the tan, that I shall try it more extensively another season, and with other crops. I used several kinds of potatoes. The quantity of seed in each hill was nearly the same; the manner of hoeing and treatment the same throughout. I am sorry not to be able to state the facts with more precision. But if any one should be induced to imitate my example, I hope they will be instructed by the experiment. I certainly have been. WILLIAM SUTTON.

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I concur in the opinion above expressed, as to the superior quality of the potatoes grown in tan. J. W. PROCTOR.

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We are under great obligations to General Sutton, and to our constant friend Mr. Proctor, for the details of this interesting and successful experiment. If farmers everywhere would devote a few hours of their time, and a good share of judgment, to experiments in each season, our advance in the knowledge of cultivation would be more rapid than now.

But next to the careful culture of your soil, friends, and the trial of reasonable experiments for the common good, we would urge you to practice more with the pen. It is the mightiest engine in this world of steam, lightning, and gunpowder. You should be familiar with its use. Many of you would rather saw and split a cord of wood, than to write a page of original matter for the public eye.

The inquires as to the value and use of tan are frequent; and we will welcome other statements from those who have experimented with it. In many, if not most places, spent tan may be had for the carting, and everywhere for a small sum; if, then, it is useful as a direct application to plants and crops, let us know it.—*Practical Farmer.*

Massachusetts Horticultural Society.—Grapes.

To the Chairman of the Fruit Committee of the Massachusetts Horticultural Society.

DEAR SIR:—In accordance with your request I herewith give you the modus operandi of growing grapes under glass, to ripen them by the December sun. My former practice, to ripen grapes about the 1st of April, was the same as is practised by others, say warming the roots by hot manure, in the middle of November, and continuing the heat in the border by fresh supplies of manure, until the grapes ripened. I notice the roots are injured from this practice, and the expense is very great, not only for the manure but also for the labor of looking after the border, and replenishing it. Not being satisfied I concluded to try the following plan, which has proved quite successful, and gives me the grapes earlier. We will suppose the vines were started in November of last year,—to get them in this state their habits have been changed from the natural time of starting. Now we will encroach still further, and start them in August, say the first. You will find no delay in the pushing of the bud after pruning, as the roots are warmed by the summer sun, and no danger of killing the young rootlets from hot manure. The progress of the vines will surprise you; in a week they will require tying up to the rafters, and very soon after you will be assured of a good crop of grapes, from the fragrance of the bloom. It is now of the utmost importance to at-

tend in season to keep the heat in the border, which the sun has so generously supplied, and a plan suggested itself to me from the practice of keeping ourselves warm by a blanket, of which I have manufactured some 600 pairs a day for the past ten years. It is therefore very natural that I should have thought of a blanket to cover the border to keep the heat in; but it would require a great many woollen blankets to cover a border 100 feet long and 40 feet wide, and a great many thicknesses to give sufficient protection. However, we have the principle in the thought, and now for the practice. Instead of the woollen blankets I substituted two tons of meadow hay, very dry; this covered the border about one foot in thickness, and in order to keep it dry I placed upon the top of it about six inches of waste and manure, to absorb the rain, until the frost should make it a more perfect protection. This has answered the purpose; the heat has passed from the border, about three degrees a week from the first of December, at which time it was sixty, and the fruit has ripened perfectly. It was generally supposed by grape growers that I should fail in color and flavor, as well as size, from want of sun, in December; but my experience proves a plenty of pure air is quite as important. My mode of ventilating is entirely new, and appears favorable to the growth of the grape. The warming apparatus inside of the house, is simply a stove at each end, consequently the ventilation is complete, as the heavy bad air is constantly rushing to the stoves, and passing out of the funnels.

I do not, in speaking of this mode of ventilation, recommend stoves for heating in preference to the common furnace and hot water pipes; but refer only to the principle of ventilation, which can be applied to the common furnace, by conducting the air from the house to supply the coal instead of the outside air; this plan would as effectually draw off the bad air as my stoves.

It has been stated that I get two crops of grapes in one year from the same vines. It is true that this year I have, but as I have not practised this mode of growing grapes, I cannot recommend it, but should have apprehensions, if followed up, the vines would soon show injury. My present judgment would be rather to receive from them one crop in two years, than two a year.

You will notice from this statement that the real advance in Horticulture, which I think is secured to us, is, that we may supply ourselves with delicious grapes during the months of January, February, and March, which heretofore was considered impracticable by our best grape growers.

Respectfully yours, M. H. SIMPSON.

GRAPES.—*Open Culture.*—This has, indeed, been an awakening season for seedlings, and all outdoor grapes. It is the first of a perfect furore or mania, in bringing out of slumbering varieties, and though your Committee have been obliged at the tasting board to make "wry faces," sometimes, yet they have been well recompensed in believing that a few of the many may prove essentially valuable, enabling almost every *cottager* to produce enough for "home consumption," and though some of the seedlings may not rival the Isabella in flavor, still the Committee think there are five or six varieties which *may* prove sufficiently early in ripening to enable a sure culture, where the Catawba and Isabella have in vain been attempted.

The "Concord," a seedling raised by E. W. Bull of Concord, Mass., has attracted much attention during the past year, and believing you desired all the information which we could bring to bear on this one variety, the chairman signified to Mr. Bull, that an invitation from him to the Committee to visit his premises, with full privilege to examine and scrutinize all and every fact at hand, (which might bear on the subject,) would prove acceptable to the Committee—and in the event of his seedlings proving valuable or not, the Committee, one and all, believe in the honesty of Mr. Bull. There was on this occasion, as on all others, a modest bearing, free and frank answers to each and every inquiry from the Committee.

Mr. Bull responded to our request, and

on the 7th September all the Committee having been duly notified, visited Mr. Bull's garden at Concord. The locality of the vines is on a southeast exposure, protected on the north and northwest by a hill; the soil sandy. The first vines examined had received a coating of clay to a part of the vines. On this the growth was twelve feet on the average. On other vines was superadded a coating of horse manure. The bunches averaged seven inches in length. The next vine examined had been manured with animal manure, viz., two dead calves. On this vine the bunches were from six and a half to thirteen and a half inches in circumference, while the berries were two and a quarter inches in circumference, though not so highly colored as on other vines where no animal manure had been applied. Well water alone had been applied since the spring manuring. The vine was allowed to mature sixty bunches, many of which were, in the estimation of those conversant in the growth of the Black Hamburg, deemed to weigh a pound, if of that variety.

Another set of vines had received one peck of guano to fifteen hundred and eighty-four square feet of ground. In the rear of a row of vines, one hundred and twenty seven feet in length, Mr. Bull had placed barrels, allowing one barrel to every two vines, which had been filled with leaves collected indiscriminately from the adjoining woods, well pressed down, on the top of which he put a peck of wood ashes to neutralize the acidity, and through each barrel leached a bucket of water twice a week previous to the first of June. On a portion of the vines the grapes appeared ripe, and those tested the following Saturday were in condition.

Of its seasonableness and productiveness the Committee are favorably impressed. Mr. Bull had an Isabella vine at the southwest end of his residence, on which the berries were just beginning to color, which HE considered as occupying a more favorable locality for ripening than the former.

The Committee would have been pleased to have found growing side by side, the Concord and Isabella, as more surely testing the ripening. Should this grape in other localities prove early, as in the hands of the originator, we predict a general cultivation, WHERE the Isabella FAILS to ripen.

Mr. Bull has some fifteen hundred seedling plants, showing a great variety of leaf.

From the sample of wine made from this grape, we were fully of the belief that this grape will prove exceedingly valuable as a wine grape.

SALEM, December 20, 1854.

To the Chairman of the Fruit Committee of the Mass. Hort. Society.

SIR:—In answer to your note of the 16th instant, received yesterday, I will say that, generally speaking, the past season has been one peculiarly favorable for ripening *grapes*. I shall refer only to such varieties as have ripened their fruit under my own care. The old established varieties, such as Hamburgs, Chasselas, and Muscats, have fully sustained their reputations. The seedlings from the Hamburg, Wilmot's No. 16, and the Victoria, have proved fully equal to their parent in respect of bearing qualities, with proper cultivation its superior.

Wilmot's new Black Hamburg is variable in quality and bearing, and requires full sunshine and a free circulation of air to make it set its blossoms. It should hang upon the vine long after the color has become black, before it is fully ripe and fit for the table. When grown in this manner, it is quite equal to either of the other Hamburgs. The "Cannon Hall," the seedlings of the Muscat of Alexandria, has likewise proved every way equal and probably superior to that variety. The other sorts in common cultivation, so far as I am aware, have not varied from the usual method or condition at ripening, and may still be recommended to cultivators seeking a number of kinds.

Several seedlings have fruited in my collection; the largest proportion of them proving small, (although of good flavor) have been discarded. One, a very sweet, rich *Black Grape*, is reserved for further trial, for cultivation under glass.

The Bronze grape, introduced by the Mayor of Boston, Dr. Smith, from Syria, who brought the seeds with him from that country, has fruited for the first time this year. The fruit closely resembles the Queen of Nice. It ripens sooner, and does not keep as well. Two or three seasons should be given before giving a complete description. At present it promises well.

The seedling referred to in a former communication, raised from Wilmot's New Black Hamburg, has been this year discarded, having proved too sour.

Of the recently imported varieties said to be seedlings, I have fruited the Gross Bleu, and cannot distinguish any difference between it and the old Black Hamburg — "Cambridge Botanic Garden Grape" is like the "Black Prince," and not worthy of being considered a distinct variety. "Gross Gromier du Cantal," is nothing but the "De Candolle." These vines were received from the best sources, and it is presumed they are correct. "Perle Rose" is another name for the same variety.

For early forcing, the "Pitmaston" White Cluster, and "Musque Verdel" yet remain the best. The "Macready Early White" is inferior in flavor and uncertain in bearing. The new White grape, which I call "Allen's Hybrid," promises to be at the head of the list for early forcing.

For retarding I find a difference in the ripening and keeping of the same varieties from year to year. By comparing the list now given, with that of last year, this may be seen. At the head of the list, (and as they are named the one for the other, may be considered as most valuable for their keeping or hanging in a fresh condition,) is the "Wortley Hall Seedling," the same as last year.

"Prince Albert," generally a poor bearer, but as it becomes old bears well, this year has a great crop.

"Poiteau Noir," large berry, lacks flavor.

"Queen of Nice," very handsome and good.

"Syrian," when fully ripe a rich grape.

"Black Lombardy." There is an uncertainty about this grape. It has been said that West's St. Peters and this are identical. I have the two, both late kinds, and very unlike. The "Black Lombardy" has a larger berry, and is not so black. It is a valuable sort.

"West's St. Peters." Part of the bunches have dried some, and part are fresh; has not done as well as in previous years, in respect to keeping.

"Xeres," or "White Nice," this year has kept well. It is however uncertain.

"Muscat of Alexandria," and the "Cannon Hall," both of them have dried somewhat; but the flavor of both, if anything, is improved by the process; the berries being large. This drying is not so objectionable as in small grapes.

"Ferrar," or "Black Portugal." A large part of the bunches have this year decayed or dried. Some bunches remain fresh and full.

The old "Black Hamburg" never has kept so well. Some vines have the entire crop yet on, fresh and full, while on the other vines the fruit is much dried.

"Wilmot's New," and the "Victoria Hamburg" have not kept so well as the old. In previous years they have kept rather the longest and the freshest.

Hardy Grapes for cultivation in the open air, have had several seedlings added to the list this year. The most beautiful one, undoubtedly is the "Concord" grape. I do not cultivate it myself, and can only speak of specimens as they have come under my observation. In flavor it ranks in my estimation after the "Isabella." For Massachusetts I should place "Diana" first, and "Isabella" next. Further south, "Catawba first and the others in same order.

Hybrid Grapes.—The past season I have fruited several hybrid vines. Some of them have given fruit of fine flavor, and free of pulp. Several of these have been shown at different Horticultural exhibitions. As early as 1848 it was stated in print that I had planted an Isabella vine in a grapery, for the purpose of impregnation, with the expectation of obtaining a variety that would mature early and be an improvement upon the

kinds of hardy grapes which we already had in cultivation. At that time the seedlings, between forty and fifty in number, were growing, and presented such a marked variation of foliage, as to give good hope of success. Had this been otherwise, further trials by impregnation would have been made. Being aware of the incredulity of many, in the certainty of the origin of a seedling, particularly when it presented a great change from the parent, every means were taken to make the case certain. The parent vine was the only one at the time in the house, it being occupied with peaches and nectarines; part of these have since been removed and vines substituted. To be sure that bees or no external cause could affect the impregnation and thus defeat my efforts, the vine was forced in January and blossomed before vegetation commenced in the open air. When the embryo bunch approached the time of blossoming, a few of the strongest were selected and the others, at least all near those bunches, were cut away. Before the blossoming the buds were thinned out, leaving only one fourth part of the strongest and best placed of them. As they expanded, they were constantly watched and the anthers at once cut away with sharp scissors. With a soft brush the pollen from the European kinds was applied. This was collected from a forcing house and was mixed together in a box, having been taken from "Chasselas," "Black Prince," and Black Hamburg. When the impregnation took effect, the embryo swelled at once; when otherwise, it remained as it was. Thus I was assured that any seed obtained must produce a hybrid vine. When the fruit ripened, the seed was collected and planted in soil which I felt certain could not have any other seed of grapes sown accidentally. The young vines have always been under my care. I potted them and repotted them, and planted them out. Those already fruited have proved black in color, all but one, and this being so remarkably early and a very sweet fine fruit, that I at once considered it an acquisition. The seedlings were exposed to the winter, after they had become somewhat grown. The tender ones were killed out, leaving over twenty that have proved sufficiently hardy to withstand our winters, with a slight covering of straw around their roots. This grape has been named "Allen's Hybrid." It must be proved now in exposed situations before it can be fully known that it is adapted to culture in the open air in our climate.

The vines that have fruited have all been under glass, not forced however, and in a very favorable situation, fronting north of east, and shaded by large trees. It is questioned if "Black Hamburgs" or Chasselas would ripen in this house. There is no doubt of this grape proving a valuable one for early forcing and the cold grapery. It has been questioned that this is the origin of this variety, and the fact that a white can be produced from a black grape denied. It is said that a seed of some European variety must have been in the soil and produced this vine. I cannot deny that this may not be the fact. I do not think so, however, and the foliage shows every indication of a hybrid. N. Longworth, Esq., of Cincinnati, has raised white seedlings from our natives, and a fine white from the Catawba. He thinks so at least; the doubters probably will say in his case, also, that he is deceived. The foliage of American kinds is so unlike the European, that the charge of a Chasselas or Sweetwater seed having been in the soil, cannot apply in his case.

It will require two or three seasons yet before those hybrid seedlings will be so tested as to warrant their introduction into cultivation in the open air. If you consider these remarks relative to grapes to be of any public value, you can make what use you please of them.

Respectfully Yours,

John Fisk Allen.

☞By the rules of justice, no man ought to be ridiculed for any imperfection, who does not set up for eminent sufficiency in the way wherein he is most defective.—*Tatler.*

POLLEN.—The length of time, during which it retains its vitality, is very different in plants. Gaertner says that in some species of nicotiara (the tobacco family) the pollen retains its vitality only 48 hours —that of Datura (of the poto family) the same—of Candollen one year; and of some palms and of the Chamærops humilis (of the palm family) more than eighteen years.

Nearly all Botanists agree in the existence of tubes proceeding from the pollen—instrumental in reaching the ovules of plants. As to Hybrids, the pollen of one species will fertilize the ovules of another, producing plants strictly composed of the properties of both plants as mules are of the horse and the ass. Some very analagous plants, however, will not mix—such as apple with pear, gooseberry with currant, raspberry with strawberry. Hybrids do not perpetuate themselves by seed, and if not absolutely barren at first, they usually become so in the second or third generation.

Hybrids may be fertilized by the pollen from one of their parents, and in that case the offspring takes the character of that parent. Hybrids are abundantly produced to obtain very choice flowers and fruits—the plants are propagated by cuttings. In this way beautiful roses, roses rhododendrons, pansies, cactus, pelargoniums, fuchsias, calceolarias, naricissuses, &c., are produced. The size and color of the flowers are improved—tender plants are rendered hardy and the flavor of fruits heightened.—*Balfour*.

CAMETHA CULTURE AT KAZAN.—A letter from Bouterloff, Adjunct Professor of the Imperial University of Kazan. [Kazan is on the river Kazanka about four miles above its fall into the river Wolga, in lat. 55° 47′ 26″ north, long. 49° 21′ 9″ east.]

I send you some information as to our method of cultivating the camellia.

The composts which we use differ from those used by your Mon. Leguay—we have none of his heath soil, and we replace it by soil formed of pine leaves, well mixed with sand. My experience proves that the camellia roots well and promptly in a compost soil made of earth of leaves—muck and sand—night soil in solution is added.

Camellias cannot be transferred to new pots successfully, except immediately after the flowering is over, and before the spring growth begins, or towards the middle of summer, when the sap is stationary.

We cultivate several varieties of the camellia here, and others of the temperate latitudes. They give us well developed flowers, but we never prune them as we should do. I regard it as a necessity for this charming tree. I regret that Mr. Leguay has not yet gone into the practice of budding the camellia, and other methods of multiplying a plant so interesting to amateurs.—*Revue Horticole, Paris.*

CHEAP WASH FOR COTTAGES OF WOOD.—For the outside of wooden cottages, barns, out-buildings, fences, &c., where economy is important, the following wash is recommended:

Take a clean barrel that will hold water. Put in it half a bushel of quick-lime, and slake it by pouring over it boiling water, sufficient to cover it four or five inches deep, and stirring it till slaked.

When quite slaked, dissolve it in water and add 2 lbs sulphate of zinc (white vitriol), which may be had at any of the druggists, and which in a few weeks will cause the whitewash to harden on the wood-work. Add sufficient water to bring it to the consistency of thick whitewash. This wash is of course white; and as white is a color which we think should never be used, except upon buildings a good deal surrounded by trees, so as to prevent its glare, we would make it a fawn or drab color before using it.

To make the above wash a pleasing cream color, add four lbs. yellow ochre.

For fawn color, take 4 lbs. umber, 1 lb. indian red, and 1 lb. lampblack.

To make the wash grey or stone color, add 4 lbs. raw umber and 2 lbs. lampblack.

The color may be put on with a common whitewash brush, and will be found much more durable than common whitewash, as the sulphate of zinc sets or hardens the whitewash.

DEPTH OF PLANTING—Seed buried ½ inch deep, up in 11 days 7-8ths of them; 1 inch deep, in 12 days, all; 2 inches deep, in 18 days, 7-8ths; 3 inches deep, in 20 days, 3-4ths; 4 inches deep, in 21 days, ½; 5 inches deep, in 22 days, 3-8ths; 6 inches deep, 23 days, only one came up.

The rays of the sun furnish light—those nearest the yellow are remarkable for impeding the germination of seeds; while the lead or heat-giving rays are favorable to it, if plenty of water is present; while the blue rays, or those concerned in chemical action or actimsin, (from the Greek actin, a ray) accelerate the process and cause a rapid growth. His experiments were, making the light pass through colored glasses upon the vegetable. He thinks that a blue

glass will prevent scorching of leaves, and that red glass will increase the heat. He says that a pale green glass made with oxide of copper, is best fitted for conservatories—green being a compound of the yellow or luminous rays with the blue or chemical rays. A delicate emerald green glass has, at his suggestion, been used in glazing the large Palm House at Kew.—*By Petri.*

FRUITS IN OREGON.—Fruit growing is attracting a lively interest throughout Oregon. The farmers are generally planting out large orchards of the choicest kinds of fruit. We have most of the leading varieties cultivated in the northern States. In the summer of 1847 Messrs. Lewellen and Meek, from Iowa, brought across the plains most of the leading varieties of fruits cultivated in the West, and now have a large nursery and orchard of bearing trees at Milwaukie, eight miles below this place. Some of the pears sold at a dollar each; apples at twenty-five cents, and some, I believe, fifty cents. I brought from New York, in the fall of 1850, some twenty-three hundred fruit trees, embracing most of the leading varieties cultivated there. These were, I believe, the first trees ever brought to this coast by the Isthmus, that lived. Fruit trees make an astonishing growth here, and bear early, and the fairest fruit that I ever beheld. Some fifteen different kinds have borne fruit this year, on small trees, only one year from the bud.

Our climate seems peculiarly favorable to the growth of trees. I have not seen ice thicker than window glass this year. We have had only three hard frosts; just enough to stop the growth of trees. All kinds of hardy grass is yet growing finely, so that the loose stock are fat without being fed.—*Horticulturist.*

Massachusetts Horticultural Society.

On Saturday, May 27, 1854, the following report was made:

The select Committee appointed by this Society to examine into all the circumstances attending the award to Messrs. Hovey & Co., of a Gold Medal for a seedling cherry and a gratuity of $20 for a seedling pear, report the following facts:—

That at the last meeting of the Society (in 1853) previous to the incoming of the newly-elected Officers and Committees, the Chairman of the Fruit Committee presented a draft of his report; which was recommitted to him for completion. That in the draft of report, so submitted, no mention was made of any award of medal or gratuity to Hovey & Co.: nor up to that time—the last day of their existence—had the question of such awards been discussed in committee.

That after the adjournment of the Society on the day above mentioned, and after the departure of the Chairman of the Fruit Committee, C. M. Hovey called together three members of the Committee (which consists of seven members) and urged upon them, very strenuously, the merits of the seedling cherry, which he claims to have originated, and of the pear, which he claims to have introduced. That two of the three members were, of opinion, that the cherry had not been exhibited for five years, as required by the rules of the Society. This position was controverted by Mr. Hovey: who also contended that his seedling was conceded to be the best that had been exhibited.

Your Committee understand, that, when the matter was pressed to a vote, one member (of those present) declined to vote, one other voted for the award of a medal with the proviso that it should be proved to have been exhibited for five years, and the other member voted for the award without conditions. The vote upon the pear was about the same.

The Committee are further informed that the first intimation received by some members of the Fruit Committee, that such awards were even contemplated, was obtained from the printed Transactions of the Society.

In the opinion of your Committee, this conduct on the part of a competitor for the highest premiums of the Society ought not to pass unrebuked. Not only is it subversive of all order and good government, that committees should be called together without proper authority; but the offense is magnified, when the person usurping the powers of the chairman is himself the claimant before the committee,—a party to a suit, before judges whom he may select for himself, and the ex-parte advocate of of his own interests. The Society is wronged, because their rules are trampled upon:—The Committee is wronged, because they are deprived of the benefit of a full discussion and of time for consultation; the unnotified members are wronged, because they are allowed no voice in the decision; the members present are wronged, because they are subjected to the personal solicitations and persistent pleadings of the applicant; other competitors for the premiums are wronged, for their claims are pushed aside; the public is wronged, because it accepts as the well-considered action of the Society, what is, in truth, but the opinions of one or two members, hastily

convened, and hurried to a decision by the party most interested.

If this instance of irregularity, which has been brought to the notice of the Society, is suffered to pass without censure, your Committee believe that the public will regard, with diminished confidence, the decisions of the Society:—for they will, with reason, suspect that our medals and gratuities for new varieties of fruit, flowers and vegetables, are indices rather of the adroit management of the applicants, than of merit in the articles. The number of Exhibitors at our shows and of competitors for premiums will be sensibly diminished; for modest merit will have no chance against unscrupulous assurance. Already complaints "not loud, but deep," have been heard, that rules, which are stringently enforced against some members, are broken with impunity by others.

In view of the facts above stated your Committee present the following resolutions for your adoption:

Resolved, That the conduct of C. M. Hovey, a member of this Society, in procuring the award to Hovey & Co., of a Gold Medal for a Seedling Cherry, and of a gratuity of $20, for a Seedling Pear was irregular and improper, and is censured by this Society.

Resolved, That a committee of three be appointed by nomination, to examine and report, what, if any alterations are needed in our Constitution, or By-Laws to prevent a repetition of such a transaction.

Signed WILLIAM S. KING.
SAMUEL WALKER

London Pomological Society.

The *Pomological Society* held its monthly meeting on the 4th of December, at its Rooms, No. 20, Bedford street, Covent Garden. Ten new members were elected, and collections of Apples, chiefly from the cider districts, were exhibited. The exhibitions of such collections are of the greatest utility; for they furnish the means not only of securing to the specimens their correct names, but of enabling the Society to report on the influence of soil and situation over each variety. When the first number of the Society's Transactions appears, which, we are informed, will be in January, the practical benefits derivable from such exhibitions, and of such a Society, will be apparent.

We not shall enter into details of what took place, because we think that these should be first made public through the Society's own records; but we must notice that one of the Apples from Herefordshire, the *Flanders Pippin*, was decidedly the best dessert Apple exhibited. We may go further; for we think it among the very best dessert fruits now in season. We more especially notice it, because in Hogg's "British Pomology," the only work in which it is described, the author mentions it as "a culinary Apple of second-rate quality." In Herefordshire, the climate, or the soil, or both, had given to it the improvement we notice.

The following is the description given in the "British Pomology:"—

"Fruit, medium sized, three inches wide, and two-and-a-quarter high; oblate, and marked on the sides with ten distinct angles, five of which are more prominent than the others. Skin, pale green, changing to pale greenish-yellow as it ripens, and occasionally tinged with a cloud of thin dull red on the side exposed to the sun, and thinly strewed with a few dots. Eye, closed, with long and downy segments, set in a narrow and ribbed basin. Stalk, from half-an-inch to an inch in length, slender, and inserted in a deep funnel-shaped cavity, which is lined with russet. Flesh, white, tender, and marrowy, juicy, and briskly flavored.

"A culinary apple of second-rate quality; in use during October and November.

"It is much grown in the Berkshire orchards."—*Cottage Gardener*.

VALUE OF FRUITS.—It may not be without interest to compare the valuation of orchard fruits cultivated in this country at different periods within the last fifteen years. In 1840, according to the census of that year, the value of orchard products was $7,256,904, besides 124,734 gallons of domestic wine. The census of 1850 gives $7,723,186 worth of orchard products, and 221,247 gallons of wine, showing only an increase of 466,282 in value of fruit, and 96,515 gallons in the production of wine; both of which are unquestionably too low. The amount of domestic wine made in the United States in 1853 may be safely estimated at 2,000,000 gallons; which, at $1, would be worth $2,000,000. Add to this $18,000,000 worth of strawberries, blackberries, raspberries, cranberries, and orchard products, the value of fruit, cider, vinegar, and wine, of domestic growth and manufacture, would amount to $20,000,000. *Patent Office Report*.

STORING POTATOES.—Potatoes when stored for the winter should be protected from light, as this causes them to become bitter, and very often accelerates germination so early in the spring, as to injure the seed.—*Working Farmer*.

Horticultural Societies.

MESSRS. EDITORS:—It is said that in order to attain to a high degree of perfection in any one thing, we must set the standard of that perfection before us, and gradually approach it; so with our Horticultural Societies. We ought to set a high standard of excellence and utility, and not rest satisfied until we attain it. For I do not believe that any Society, not even the maternal one of Cincinnati, has yet quite attained the *acme* of perfection. In view of this, and seeing that Horticultural Societies are springing up on every hand, and daily becoming more numerous and important, I thought a few hints on the subject might not be out of place.

We believe then that a high standard of excellence, both individually and collectively, should be aimed at in order to render Societies more effective as a means whereby the public should be guided in their choice or acceptance of "Horticultural Novelties." It is through them that all really good novelties should come recommended, and all worthless trash denounced. So that the public may not have to depend on the bare assertion of the unprincipled and dishonest; or if they persist in doing so it must be at their own cost. And as it is the province of those Societies to take charge of and foster the science, so it is their duty to expose all sorts of trickery, fraud and deception, whenever it comes under their notice. Then if the uninitiated would look to them, and not suffer themselves to buy a "pig in a poke," many of the evils of which your correspondent (*) complains, might be got rid of or remedied. We consider there is a higher object than merely getting up a splendid exhibition, which legitimately belongs to those Societies and that is, they should be made the media through which all new fruits, flowers, and vegetables should be thoroughly tested, and all really meritorious subjects made known. For it is evident the only other way for a grower to make his products known is through himself, by advertising or otherwise and here the impudent, fraudulent pretender stands on an equal footing with the honest, skilful and laborious experimentor. The latter would come before the public, through the Society, with confidence from which the other would shrink. The genuine improver would be appreciated and remunerated, while the quack would be exposed and held up to contempt, and the public would be saved from being gulled, unless they choose to be so, of course the Society must be high toned, and conducted by honest, able, and responsible men.

But it is to the details of the management of exhibitions, and the duty of committees, to which I wish at this time more particularly to refer. For there is nothing upon which the success of Horticultural science so much depends, as on the management of Societies established for its promotion. Nor is there any one thing so detrimental to it, as the mismanagement of these establishments. I must first make myself understood with regard to my ideas of the intentions with which these Societies were founded, and are supported; and this may be done in a few words. They are intended to promote the advancement of Horticultural science—and this brings me to the means by which they profess to accomplish their objects. They have to excite the emulation of gardeners and their employers, and also of amateurs, who are neither the one nor the other. This they have attempted by public exhibitions, at which cultivators, professional and otherwise are invited to show their best productions, for prizes, and at which the public may be gratified by witnessing the most beautiful subjects grown in the highest perfection. Now it requires no great penetration to see that the following ought to be something like the main points to be looked to, for carrying out their objects.

First.—To throw open all prizes to those

subjects that should attract the greatest number of competitors.

Secondly.—To take care that the subjects themselves, should, for the most part, be such as will most gratify the public.

Thirdly.—To appoint for judges, persons whose character as censors should be above suspicion, and advertise them to the world.

Fourth.—To announce publicly, and in good time, the rules or standards by which those judges are to estimate the merit of the different productions submitted. To do all this as it should be done, there must be something like attention to the following details.

One of the means by which the greatest number of competitors can be attracted is the number of prizes given in each class. And to do justice in this way there should be no frivolous distinction in classes; there should be as few classes as possible, (yet all must be represented) and as many prizes given in each class as possible; because most persons who excel either from their mode of cultivation, or the number they grow, may, time after time, take the first two or three prizes, (and that is as many as there usually are,) if there were four or six, there would be a chance for two or three to be taken by younger aspirants to Horticultural honors, who would never compete for the three higher prizes, but who if they took a fourth or fifth prize would be stimulated to compete again, and soon, perhaps, with increased success.

For instance, let us take Dahlias or any other cut flower that is shown in single varieties. If instead of the multiplication in classes,—as first and second best 24, ditto 12—ditto 6, and so on, there were to be but one class, with 4 or 6 prizes in that class, and a given number of varieties according to the flower, then it is obvious there must be 4 or 6 winners. As it is at present we often see the awarded premiums stand thus: Best 24, Mr. A.; second do, Mr. B.; best 12 Mr. B.; second do, Mr. A.; best 6, Mr. A.; second do, Mr. B. Thus two competitors will take all the 6 premiums. The very likeliest thing imaginable to destroy all confidence and future competition. The same may be said of plants. If instead of making three classes of mixed greenhouse plants, there were only two, or even one, the list might stand thus: For the first, second, third and fourth best collections of stove and greenhouse plants, and the same principle might, we think, be carried out through the whole exhibition, to the manifest improvement of the whole. For no doubt the number of competitors would be increased, and the number of winners certainly would; a more general emulation would be begotten, because more would have a chance to take a premium, and a larger exhibition would be the consequence. To make this feature still more complete, there should be a very gradual descent from one prize to another—say a tenth part difference.

The choice of subjects for which prizes are to be given, should be made with a view to the creation of a fine exhibition. For it is chiefly on the floral department that it has to depend to draw visitors—and the less subjects are confined, the better—or rather the less prizes are confined to particular subjects the better. So whilst the ornamental department must be the primary object—the useful must be assisted by every available means.

Then at the exhibition table some reform is needed; as it is at present conducted, it is a jumble of confusion enough to bewilder any judge. All articles, that are intended to compete in a certain class, should be placed side by side, so that the judges may have a chance of weighing fairly the merits of the different collections under notice, which cannot be done if one collection is one side of the room and the other the opposite, perhaps mixed up with other things, so that the censors can never properly distinguish them. Every article or collection should be placed under its proper class, and all should be made to come under one or the other, as much as possible. Where that cannot be, they should be entered and estimated accordingly, and not placed to mingle and confuse the regular classes. Unless something like the above be adopted it is impossible that fairness and justice can be done to all parties, and if it is necessary to arrange the plants and

flowers, so as to appear to better advantage to the public, let that be done after the judges have gone round.

As to the judges themselves, competent, impartial men, from a distance, should be secured if possible. Men whose practical eye enables them at a glance to do justice to the skill of a gardener. Three such men is quite sufficient to go through the whole exhibition, without having from three to six in each department. It must be remembered that local judges, however honest and able, seldom give satisfaction to all parties.

More attention must be had as to the real merits of all gardening products brought to the exhibition. Fruit is the only thing that receives any notice in this respect. It is high time that we had a regular standard, in Florist's flowers, in order to raise that department to its proper rank. Indeed, we want an elevated standard of our own in every department, by which both judges and growers shall be guided in their respective functions. And this standard should be placed high that a race must be had to attain it.

Yours, &c. C.

Choice Culture.

In an article on the double Chinese primroses, I expressed a probability of resuming my remarks on the above subject, to which you were pleased to invite me. In now reverting thereto, I must disclaim any pretensions to reducing such operations to a rule, and content myself by an endeavor to awaken an inquiry that may add another link to the chain of culture by which many flowering plants may be brought to exceed even their present excellence. In my treatment of the above plants it was my aim to retard the production of flowers until the plant shall have attained a luxuriance of growth sufficient to support the most ample display of blossom. In order to effect this in any flowering plant, it will be necessary to check too early flowering by immediately removing every flower-bud that may appear until the greatest expansion of foliage be insured. I fear this is too often negected by amateurs, to whom only these remarks are addressed; and the penalty of early pubescence is defective bloom, if not total abortiveness. Permit me here to repeat the words of Mr. Joseph Hayward, that "the leaves form the excretory organs of plants and trees, and whether the supply of food be great or small, a plant or tree cannot attain or sustain itself in a perfect state of fructification until it is furnished with a surface of leaves duly proportioned to the sap supplied by the roots." This axiom is so good, so essential to a high state of culture, and so desirable to be borne in mind by the horticulturist, that he should adopt it as his motto. Ample foliage before the production of flowers is the desideratum; let the cultivator, then, by the strictest observation, seek the best means of promoting it; he will generally find a vigorous growth adverse to the production of flowers, so long as such a state shall be sustained; but it will act conversely when it shall have reached its maximum; therefore let him use his best endeavors to promote luxuriance until the plant shall have attained its standard of perfection; but if, during its progress, there should be any disposition to dilate the incipient flower bud, let it be removed, and, if it be not in the nature of the plant to reproduce blossom buds the same season, it will be better to lose a year than to have a premature and puny blossom; one plant well cultivated is worth any number badly grown.

Some cultivators, in order to effect a lofty growth, lop away all the under branches, so as to force the sap upward. Better that the plant be allowed to follow, as far as may be, its natural habit, removing only such shoots as appear stunted or misplaced; this will give girth to the stem, and preserve a more perfect symmetry. I will here instance the Fuchsia. If the taller sorts be so treated, and regularly stripped of their flower buds, until they have made their desired growth, they may be made to attain their greatest altitude with a pyramidial form, sustaining themselves without any support, their bottom branches sweeping the ground, the others rising branch over branch; when clothed with their bright, crimsom, pendulous blossoms, they present a picture of floral beauty. Many are the plants that present a stunted or straggling appearance that, by like treatment, might be caused to assume the same symmetry. The dahlia, too, might, I think, be much improved in the quality of its blossom, whether for the border or as a show flower, if, instead of the unsparing lopping away of its branches, these were carefully preserved, and the blossom-buds more fully displayed; this is borne out by the Chrysanthemum and many other plants, from which, in order to produce fine blooms, we remove most of the flower-buds, while we scrupulously preserve every particle of foliage.

I shall pass from this Leviathan of flowers to the more modest but equally well-known Mignionette. How to produce the tree is, I believe, generally understood; but as it will exemplify the subject, I will merely glance at the practice of depriving its leading shoot of its flower-bud; it is again surmounted by another shoot, from which the flower is again displaced; the same routine goes on till the plant has reached the prescribed height, when it is allowed to shoot freely, and is clothed with its fragrant bloom. By a very similar treatment, the Verbenas may be made either to spread with greater luxuriance on the ground, to trail over the vase, or to climb the trellis; for any of these purposes we have only to persevere in removing the flower-buds, from time to time as they are produced, and new shoots will be emitted, elongating to a considerable extent, at the same time multiplying in number so as to cover a much greater space. If these be allowed to fall negligently over a vase, or be carefully entwined round a trellis, attached to a flower-pot, the effect will be in either case exceedingly ornamental. The Anagallis, Petunia, Heliotrope, and various other plants, if subjected to a like training, are capable of the same effect. The Heliotrope I once saw trained round a pillar in a green-house, twelve feet high, clothed with flowers from nearly the bottom to the top. Thunbergias, Maurandias, Rhodochitons, and the whole race of dwarf climbers, will be much improved in growth by removing as soon as visible, the early flower-buds. If the Balsam be allowed to expend its first flush of flower-buds, the blossoms will neither be so large nor so double as they will if the early buds be plucked off. This will create a more luxuriant development of the plant, and the succeeding buds will be produced all over the plant in the greatest abundance, covering it with a profusion of double flowers, very superior to what would have been the effect if the plant had been allowed to expand its blossom while yet in its infant state. The Schizanthus and most annuals may be much improved by removing the first flower-buds. The cultivator will be amply repaid by sowing them (annuals) early in August, pinching off any flowers that may be produced the same year, and thus transferring them to the biennial list. Lobelias, particularly Cardinalis, fulgens, ignea, and others of that section, by having the center shoot pinched out, will produce a number of laterals, clothed with elegant flowers nearly their whole length, instead of one long and almost flowerless stem. Pentstemon gentianoides and others, Campanula pyramidalis, and a variety of the like plants are subject to the same remark. The Erysimum Peroffskianum is a striking instance of this treatment; if left to flower its center shoot, although the novel color, under any treatment, renders it pretty, it will, nevertheless, have a straggling appearance; but let this be pinched out, and the consequent radiation of shoots will display a dense patch of rich and dazzling flowers. Many bulbs, as Hyacinths, Tulips, &c., after having been grown in rooms, in glasses and flower-pots, are reduced to a state of great degeneracy; if these be planted in the free soil, and deprived of the languid flowers that will be produced the succeeding year, the bulbs will be invigorated, and thus prepared to flower well every alternate year, so long as this treatment be continued. To ennumerate all the flowering plants that might be improved by a judicious removal of the early flower-buds would be a recapitulation of nearly the whole vocabulary of plants.

Thus having redeemed my promise and responded to your invitation, I trust I have said enough to induce inquiry, and feel assured that investigation will lead to a more general practice of depriving plants of their premature flower-buds.

A Glance at Kew.

BY JOHN SAUL, WASHINGTON, D. C.

Having, during the past autumn, made a tour through the various parts of Britain; among other places visited was London and its environs. My visit having been a business one, kept my time well occupied, still I found leisure to pay a hurried visit to that grand plant establishment—Kew. Where is the horticulturist—a lover of the science—who has not longed to see this place, and once having seen it, did not wish to repeat his visit? And above all, where is there a person with a knowledge of fine plants and a lover of them, who could not spend days or weeks in this fine old place? Kew is now easily reached from London—from which it is distant only a few miles. A railroad from the neighborhood of Clapton will put you down there in a few minutes, and at trifling expense. Or if at another point of London, you can go by railroad from the Waterloo station, near the Waterloo Bridge. Again, should the weather be favorable, the visitor may have a pleasant sail by steamer down the Thames. The

24th October, being a drizzling, misty day —a common occurrence at this season of the year in England—I went by railroad from the Waterloo station.

Whilst on his way the horticulturist will have much to interest him—the line of road passes through several large market gardens, the high state of cultivation in which everything is seen, will interest, if not instruct, the cultivator. We are soon set down at the pretty old village of Kew. There is an open ground of some extent in front of the entrance, which is through a very beautiful gateway. Immediately on entering to the right, is a large span roofed greenhouse, containing fine specimens of Banksias, Rhododendron, Arboreum, and other beautiful things, more interesting to the lover of fine plants than the admirer of the gaudy. On either side of this principal entrance are fine specimens of Cedrus deodara, Pinus, Cunninghamia, etc. Passing a little farther on and bearing to the left, we enter what may be called the Conifer House. Here were noble specimens of Araucaria excelsa, A. Brasiliensis, A. Cunninghamii, and the rare and beautiful A. Bidwilli; also very fine plants of Dammara Australis, Cunninghamia Sinensis, Podocarpus, many species, Dacrydium Cupressium, and many allied genera. I must confess I was more interested with the plants in this building, than the rich collection in any other house in these neighboring gardens. Yet the structure is one of the plainest, having nothing more than glass in front, with an opaque roof; but many of the plants were perfection—they were evidently hibernated for the winter. I loitered in this house, perhaps, longer than in any other, not excepting the great conservatory being a great lover of conifers. Again and again did I admire some of those fine Araucarias, and other plants of considerable height, and feathered to the pot in which they are growing—their foliage of fine intense green indicated robust health.

Leaving here and passing to the greenhouses, we walk through the New Holland House, Heath House, Succulent House, Orchid House, Fern House, Stoves, etc., all of which are interesting, and are rich in fine, new, and rare plants. About this part of the garden are many good specimens of Cedrus deodaras, Pinus, Abias, etc. Though many of these specimens were individually good, they did not, as a whole, appear to me as fresh and vigorous as specimens which I had seen in other parts of the country. Perhaps they may be a little too near the London smoke.

A few days previous I called at Bowood, in Wiltshire, the seat of the Marquis of Lansdown. Here there is a beautiful Pinetum, containing many fine specimens of rare things, and in the finest health. Scattered through the pleasure ground are magnificent specimens of Cedrus deodara, Araucaria imbricata, Pinus insignis, etc. But I am digressing and must return immediately to Kew. I last talked about the specimens near the green houses. We will now leave this part of the garden and wend our way to the large conservatory. On approaching this fine house I must say I was, if possible, better pleased with its exterior than ever. The house, though large, is not heavy, but presents a very light and graceful outline. On entering it I cannot say I was altogether pleased, it is true. In the central compartments are some immense Palms, which, looked upon from the gallery, are seen to great advantage. I did not, however, in a general way, consider the plants in the house well grown, more particularly in either wing. To me they appeared drawn, and by no means as bushy or well grown as they may be. However, the season of the year—October 24th—was late to see them to advantage. The beautiful vines with which the roof was festooned were getting bare. It struck me then, very forcibly, that if this fine conservatory was planted with tender conifers, it would be far more effective and be far more pleasing than it now is; being full of Tropical plants, a strong heat must be maintained at all times, which makes it oppressive and unhealthy to remain in the house long. In summer it is hot and unbearable, in winter close and unpleasant,—fill this house with Araucarias, the fine long leaved pines of Mexico, the New Zealand conifers, the Arthootaxis of Van Dieman's

Land, and similar trees from various parts of our globe, and we should have a collection far more valuable than the present denizens of that house. In summer it can be kept agreeably cool, in winter just enough of fire heat is wanting to keep the frost out—nothing more. Here in the depth of winter, can be maintained the balmiest and purest atmosphere, where persons may promenade and enjoy the scene, instead of having to hurry through as now. If ever in our Middle or Northern states, a winter garden on a large scale, is formed, such as the Crystal Palace, I would suggest planting it with Conifers, they are not only the most majestic and noble, but the most graceful and beautiful trees in nature,—for what more delicate than the long leaved Pines of Mexico, the Dacrydium of New Zealand, the Drooping Cedars of the Himalays, or Weeping Cypress of China; it is not necessary to call to mind the majestic Pines of Oregon or California, or the giants of the Himalays. I would not plant any species thoroughly hardy, but such as in your latitude, would require the protection of glass; nearly all the generas would only require protection from frost, that is, the Thermometer inside the house should not fall below 32°, here then could be maintained an atmosphere pure and agreeable in winter, when all external nature is ice-bound and enveloped in snow. At this season of the year, Evergreens are seen to the best advantage, being the period of their most beautiful development; foliage and cones are then in perfection. For such a collection, a slight heat by night would be required, none would be necessary by day, save in dull and very frosty weather; but in all clear weather the house could be freely ventilated, and what an agreeable and healthy winter garden would such be! What a healthy promenade for ladies at that inclement season of the year! Contrast its atmosphere with the close unhealthy air of a tropical house, at such a season when much artificial heat is necessary! Why do not the New Yorkers convert their Palace into a garden of that kind? It is certainly possible to alter the roof, by putting a glass one strong enough to resist the heavy falls of snow, which annually occur; had they a Park in which to place it, the expense of keeping it up would not be great, and it would certainly pay as well as in its present state.

But returning to Kew: in the part of the garden in which the Conservatory, but farther down, is the Victoria House, a very pretty low structure, in which this noble Water Lilly is grown. The interior is very tastefully arranged, and contained many handsome Aquatic plants, in addition to the Lilly. About these houses the ground is laid out geometrically, beds of summer flowering plants, with many Irish Yews planted on the grass, the latter is certainly one of the prettiest of Symmetrical Evergreens; I think it is the late Mr. Loudon, who remarked that it was the most beautiful of Evergreens for a Cemetery; this it unquestionably is, and not only is it beautiful for this latter purpose, but for planting flower gardens, lawns, terraces, etc.,—it is used for this purpose very much in England, and I know few small and moderate sized Evergreens more deserving; collectors in this country should plant this extensively, more particularly in Cemeteries, Court Yards, etc., where it is now, alas, rarely to be seen. In the public grounds of this city, are some handsome young thriving plants, growing as in any part of Europe.

Scattered about the Park, are many fine specimens of rare trees, clumps of Rhododendrons, etc. Time only allowed me a few hours for the inspection of these grounds, to do which properly, would have taken as many days to give a more minute examination. In conclusion, I would recommend every lover of Horticulture, on visiting in England, not to forget Kew.

Worth Knowing.—It is said that a small piece of resin dipped in the water which is placed in a vessel on the stove will add a peculiar property to the atmosphere of the room, which will give relief to persons troubled with a cough. The heat of the water is sufficient to throw off the aroma of the resin, and gives the same relief as is afforded by a combustion of the resin. It is preferable to the combustion, because the evaporation is more durable. The same resin may be used for weeks.—*Farm Journal.*

The Crystal Palace.

About this time two years back people began to ask me, "Have you been to the Crystal Palace yet?" and, as I take it, they did so on the same principle as they do in Scotland; when a "body meets a body," and wishes to draw him into conversation, he brings out the snuff-box. Some were surprised, "of course," to find that I was not more curious, or more interested, in the progress of the work. "Of course" I could obtain free admission from Sir Joseph Paxton, who never "turns his back" on an old acquaintance. But, "of course," all this is but the old story over again, about your having a friend at court, in parliament, or in the vestry, and your particular interest ought to be his peculiar study, "of course." But, "of course," also, "Auld Lang Syne" was never meant to cover impertinence. I would much rather ask favors of a perfect stranger than of Sir Joseph, under the circumstances, on the plea of "birds of a feather," than on the strength of old acquaintanceship from any one. Besides, all the great details were given out in the newspapers as early as the autumn of 1852, and from time to time subsequently—and such details, too, as were more complete for the mind's eye than those which were detailed in the first Guide Book, at the opening of the Crystal Palace, to the eyes of any of us. With the exception of the steepness of the grounds, the undulations in it, and the general elevations of the Palace itself, I had as clear an idea of the whole, from these reports, as I have now after spending two days there. I shall, therefore, recapitulate the heads of those details for the use of such as have not yet seen the Crystal Palace.

Early in the autumn of 1852, we were told that the Crystal Palace would stand east and west, on the crest of a hill, facing the south, and looking over a large extent of a finely wooded country; that there would be three transepts at right angles with the ridge of the hill; that two long wings would stretch out into the grounds, one from each end of the building; that the "court" thus formed by three sides of the Palace would be laid out in "an enormous parterre, enriched with statuary and fountains;" that the main walk would lead down from the front door of the Palace, in the centre of the middle transept, by flights of granite steps, through the terrace-garden, and right down to the bottom of the ground, where it would "lose itself" round a large circular basin at the bottom; that both sides of this principal walk would be alive with devices of water, and embellished with statuary and flower-beds; that after passing from the terrace-garden into English landscape, this centre walk would be intercepted by a grand circular basin, placed in the very middle of it, in which basin the grandest of all grand displays of "water-work" would be exhibited; that passing onwards, two temples of iron and glass would rise a little in advance of the grand fountain, one on each side of the grand leading walk; that these iron-and-glass temples would cover groups of statuary, and would be covered themselves, in part, by climbers, and at times by thin films of water, returning from a gushing in the dome; that a wide "step by step" cascade would run down hill, on each side of the grand walk, from the bottom of the temples, and "tumble over" at the bottom, in the shape of waterfalls, into two great reservoirs, which would stand at right angles with the central walk; that to the right and left of the Temples of the Cascades, and at some distance from them, would rise two conical hills, that to the right would be surmounted by an "arcade of arabesque iron-work," for "twining" Roses, (but Roses never twine, they climb); the other, by a similar arcade, for "innumerable" climbers (and most of them *will* twine); that parallel to the grand central walk, two secondary walks would lead from the upper terrace-walk opposite the side transepts, down through the terrace-garden and "transition" ground, to two circular basins, not quite so low down as the grand circular basin in the middle walk; that, thus, one great geometrical line ran through the whole garden, from the front door of the Palace, and two parallel lines from the upper terrace-walk to the termination of that space which claims the Italian and English style of landscape gardening, alike; that geometrical accompaniments follow these three straight lines on either side of them; and that the English style of landscape gardening would begin "gradually" to assume the "bold and free" slopes of grass, winding walks, large and small masses of trees and shrubs, with free sweeping outlines, and all the rest of it. The measurements were also given to the last inch; so, as I said before, that the whole could be as easily grasped in the mind, without seeing it, as the main features of a new country from a good map.

Well, I never went near it, till I was sure the first planting of the flower-beds was at its prime for the season. I met with no delays on the way from London, as I expected from the reports in the newspapers; got a splendid view of the gardens and Palace out of the train, passing round the "Geological Island;" saw the "beast before the flood" panting for water, at the bottom of the ground, and the first, second, and third class lions, feeding near the top,

and under the shadow of the right wing of the Crystal Palace itself; the seeming relish, mixed with the savory perfumes from the kitchen, the store and still rooms, the cellar and the larder, made my "teeth water," and I was obliged to feed too. Ten days after this a lady took me in her carriage to see it a second time. I was her ladyship's "guest for the day," and got home scot free.

Now, from the rapid sketch I have just given of the place from the newspapers, a gardener could see at a glance where the key lay for examining the details of the garden,—just at the front door, in the centre of the middle transept. In the open gallery, exactly above the front door, is the proper place to study the composition; there is no other spot, high or low, where it can be so easily "construed," as the Dominie would say. If I had been brought here blindfolded, and had not seen the building in Hyde Park, I should have wondered why blue and white flowers were not as freely planted in the terrace-garden before me, in proportion to the yellow and scarlet ones. Blue flowers, it is true, are not so telling as scarlet and yellow ones, in a large space, or at long distances from the eye; that *might* be the reason; and *one* good reason is better than ten lame ones; but then, white flowers are more telling at a distance than either yellow or scarlet. Why is it, therefore, that not a single white flower, for contrast, or for combining, is seen in this garden, which is said to be nearly one-third of a mile long, and above five hundred feet wide? Nothing can be more clear, and easier accounted for. The whole area, or nearly the whole, is already bounded by blue and white; the whole of the back-line and both ends of the garden, up to sky-line, is one entire mass of blue and white, in the elevations of the Palace itself, the long, horizontal, light-colored lines of the terrace-walls and walks, the pure white marble of the statuary and flower-vases, which surmount these walls all round, and similar groups round the fountain-basins along the centre of the garden, would, of themselves, drown all the beds, so to speak, were they all planted with blue and white flowers. Add to this, all the fountains at play on a clear summer day, the water shooting up to a great height, in sky-blue jets and columns, and returning in foam and torrents, in broad blue sheets, or glassy films, or spray sparkling in a thousand shapes, and clear as crystal itself; I say, only imagine all this for an instant, and then say, "if thou can'st tell it," how tame a proportionate balance of blue and white, to the yellow and scarlet flowers, would render this magnificent garden; and then, also, if you understand the drift of my story, let me never hear such silly questions again, as—"Don't you think they have too much scarlet and yellow?"

All the shades from blue to white, as the different gay Verbenas, Heliotropes, and Ageratums, together with the pink and purple shades in Verbenas and Petunias, with the *Lucia rosea*, and *Unique* Geraniums, also, *Salvia patens*, subdued, and blue Anagallis, and dwarf Verbenas, as neutral corners or centres to start from, are all introduced here in judicious proportions, except, perhaps, the purples, and we all know they are most difficult to deal with in a new arrangement. You must actually *see* the effect of purple shades, before you can possibly assign its own station to each.

It is marvellous to me how they escaped at the Crystal Palace, with hardly a failure to speak of, in the arrangement of the different designs and beds. There is one original idea (twice repeated, however), in the centre of this terrace-garden, which is radically in opposition to the law on which the garden is laid out; I mean the three circular Rhododendron beds—in each of the two pannels surrounded by a chain of *Tom Thumb* and Calceolaria being placed in corners forming right angles; but a slight alteration in the angle of the banks will rectify that without any prejudice to the angle formed by the two walks with which the banks correspond. But the effect produced by these circular beds, in causing the chain of beds to make two angle links (beds), and a festoon (of beds) round each Rhododendron-bed, is most exquisite, and just like grace notes, by Jenny Lind, in your favorite tune. Perhaps we may engrave one of these pannels some day to show what I mean; and also to exhibit a suitable plan for enriching the design by another style of planting, or rather of connecting the beds by a different color, differently inlaid, as an artist would say. At present, this chain-pattern of Yellow Calceolaria and Scarlet Geranium, the links or beds being in double circles and an oval alternately, with each link joined to the next by a dark purple band, a yard long and two feet wide, of the *Emma* Verbana, is the richest pattern of the kind in England; and the nearest to it in the three kingdoms is at Drumlanrick Castle, in Scotland, one of the seats of the Duke of Buccleuch, where part of the gardens must be seen a long distance off, and, therefore, must necessarily be planted only with the strongest colors.

Strictly speaking, this is the only pattern-planting in all the garden, the rest of the beds being either angle beds or accompanying beds to promenade walks. The angle beds, both on the terrace and in the transi-

tion garden, just under the terrace, are well managed; there are four of them in each end pannel of the terrace-garden planted with the *Compactum* Scarlet Geranium, the eight are edged round with a purple Verbena, redder than *Emma*, and the effect produced by the two shades is extremely poor. *Compactum* is not quite a scarlet, but a shade between orange-scarlet and a pink; it never "comes to a head," as we say; that is, never makes a flat surface like a bed of *Tom Thumb*. The purple Verbena, which I object to round *Compactum*, does not come to a head either. The style of growth was, therefore, well considered; but the two shades neutralize each other. The planter was put out, also, by a purple in the centre of the terrace. The third bed from the upper corner beyond the *Salvia patens* does not agree with its match on the other side.

With these slight exceptions, which are not worth mentioning, I would challenge the most angry critic to point out a false step from first to last. The sloping green bank, on which the Palace seems to stand, follows the ground line of the wings at each end; and where the two banks meet at right angles, evergreens are planted in groups to soften the severity of the posts at both ends of the upper terrace-walk; below that, and opposite each end of the terrace, the sloping banks in front of the wings are planted in rich drapery of *Cloth of Gold*, edged with crimson. The upper line of this magnificent curtain is straight, to correspond with the line of the building; and the bottom line is formed into horse-shoe arches, with sharp points between, or inverted festoons, a crimson drop hanging down from each point; face either end of the terrace-garden, at any point within it, and you have one of these splendid draperies right before your eyes, covering so much of the bank the whole width of this garden. A magnificent conception, carried out in grand simplicity. It was meant to have a scarlet fringe along the top line of these Cloth of Gold-covered banks, but the Scarlet Geranium row, intended for the fringe, did not rise high enough this season to show above the Calceolarias from the garden side, and a stronger-growing Geranium must be planted there for the future.

The best kind of hybrid Rhododendrons are planted in beds round the squares at both ends, formed by the wings and the two secondary walks; and these Rhododendron beds are edged with yellow Calceolaria, of which they use three varieties of *Rugosa*, the broadest leaved one being the best. It is very near, if not the same, as the Horticultural Society grow in large pots for the Conservatory at Chiswick. They have *Angustifolia* also, and *Amplexicaulis* in other parts of the garden; also a good, tall brown Calceolaria, called *Pluto*, of which two match-beds stand as you descend into the transition-garden by the grand centre walk, which is here much raised above the grass, and is supported by balustrades, over which you look down on the line of beds which accompany the walk on either side, down to and round the grand centre fountain, where the more dressed ground ceases in that direction. Besides *Pluto*, you have two match-beds, at the top of the line, of Fuchsia *Carolina*, which surprised me, as I thought all the world heard from this pen that *Carolina* could not be made a flower-bed of. It makes a good neutral bed, however, as it stands here, for they have no want of flowers; indeed, perhaps it was intended for a neutral. If so, it was a good idea; as a pair of neutral beds of dwarf Rhododendrons stand lower down, at the bottom of the steps leading out on two sides from the area enclosed for the grand fountain. Two more match-beds were filled with the old *Globosa* Fuchsia. The plants were too young this season, and they must be kept over the winter indoors, or else *Globosa major* to be substituted for them another year. Lower down, another pair of match-beds were filled with the dwarf yellow *Œnothera prostrata*, looking gay, and not all with too much foliage.

D. Beaton.

The Camellia.

A paper read at a conversational meeting of the New York Horticultural Society, January 23, 1854, by R. R. Scott.

The history and cultivation of the Camellia is a very appropriate topic for us to discuss, especially after the treatment of the favorite Rose has been disposed of. We are told that "comparisons are odious."—This remark, however, cannot be applicable to plants and flowers, for comparison is one of the first duties of the florist, and the ground upon which the systematic botanist establishes his *diagnoses*. I am about to compare the Camellia, which is our subject for discussion this evening, with the Rose, which we may suppose has been fully debated at the three last meetings. In doing so I will be brief, for I know there are many present whose experience will add much to our stock of knowledge on the subject. My remarks will at least serve the object for which they are intended—that is, to cover ground which is not so much within the reach of practical men, and thus confine them to those important matters on which their discourse is more appropriately spent.

Let me enquire what is the object which is about to occupy our attention; whence it was imported; at what period and by what means; what is its value in commerce, as well as to the community generally.—It is not a fruit to please the palate of the epicure, nor an esculent to be consigned to the cook; neither is it a plant the fibre of which may be converted by the manufacturer into textile fabrics, or an herb from which the druggist may derive drugs or oils, unless we include a species little known, from which oil is in some instances extracted, the *Camellia oleifera*, as well as the familiar Tea plants, so indispensable or domestic purposes, which, though not, strictly speaking, Camellias, are closely allied to that family, and were once included by some authors in the genius Camellia. They have since been changed to *Thea*, of which there are three species—*Viridis*, or green tea; *Bokhea*, commonly known as black tea; and *Assamica*, or Assam tea.

Our subject is but a flower which fades after a few hours—the gay ornament of the fashionable belle—without even the fragrance generally attributed to flowers, to recommend it to us. Here a comparison of the Camellia with the Rose may be instituted. If I were asked what is the difference between a Camellia Japonica and a Perpetual Rose, I would doubtless regard the interrogator as a novice in horticultural matters—nevertheless, the question is worthy a reply. If a botanist were to demand the difference between a Camellia and a Rose, it would involve a considerable amount of scientific knowledge to explain the matter fully and satisfactorily. I will not now entertain the latter part of the enquiry, but say a few words on the former. Externally, the flower of a Rose and a Camellia may appear to the superficial observer to have some little resemblance. If we take a single rose, full of stamens tipped with their yellow anthers, and surrounded by a row of petals, looking no further, and compare it with a single red camellia, the resemblance is apparent. They are, however, quite dissimilar in every other point. The Rose has pinnate compound leaves.—The Camellia's leaves are simple. The leaves of the Rose are decidious—falling off each season; those of the Camellia are evergreen and *persistent*, or lasting. As to the habit of growth and nature of the wood of the two plants, any person who examines them will at once be struck with the dissimilarity.

The Camellia has no fragrance, or at all events, so little as to be impracticable to the majority of florists and the public, though some French cultivators claim that certain varieties are a little odoriferous. The fragrance of the majority of Roses is proverbial.

In geographical distribution there is the greatest dissimilarity. The Rose has been widely scattered by the hand of nature.—The Camellia has been limited—with we know not what amount of wealth, mineral, vegetable and animal—to Japan and China, the least likely countries in the world, perhaps, for them to be made available to the natives of other parts of the world. Though Jonathan has stolen a march on the very liberal Emperor of Japan by means of Com. Perry's canoe, the Camellia had been received in advance, and its introduction attributed to an individual called Camellus, a learned Jesuit, as early as 1739. I may here mention on the authority of Berlese, who wrote a monograph on the genus, that the plants introduced at this epoch by Camellus to England were not specimens of the wild type of the family known as the Single Red, or *Camellia Japonica;* but a double variety which had already been improved by cultivation in some of the Japanese gardens. The true single red, which grows to the height of a tree on its native hills, was introduced more recently by a modern traveller. The date of the second valuable importation was 1806; the varieties obtained at that time were much more important, and from these our hybrids have originated. Other contributions were received in 1809 and 1810.

It may be readily imagined that the introduction of such a plant as the double white Camellia to the conservatories of Europe at this era, would be considered of some importance, especially as horticulture there was in a progressive state. Such was indeed the case; and the Empress Josephine at a later date is represented as honoring the gardener Tamponnet with a gift of a branch of Camellia, which he well knew how to treat. The splendid establishments which have for many years been attached to the Royal residences of France, whether the occupant was a Bourbon, Napoleon, Citizen King or *Republican* Emperor, as it is at present the case, the Louvre, Tuilleries, and numerous other gardens, from Malmaison, to the Chateau d'Eu have been famous for the attention bestowed on such plants, and the *recherche* manner in which they have been kept.

These things have assisted in keeping the French people, who are generally admirers of flowers, in good humor, and rendered their political and social burthens a little more tolerable from time to time.

The introduction of the Camellia was decidedly an era in horticulture; for some years after its first importation, no new varieties were produced, as those received

from China and Japan were not fertile, and could not be propagated by seeds, or hybridized. This difficulty afterwards was overcome, and many seedlings were produced, which from time to time furnished varieties of merit. England was among the first of the European countries to enter fully into its cultivation, and in a few years Italy, Germany and Belgium were all engaged in it. Italy was decidedly the country best calculated to suit it, and there it flourishes out doors in luxuriance.

What seeming impossibility has not human ingenuity, skill and perseverance accomplished. We need not wonder that within the limits set by nature, anything may be effected. Much less need we be surprised that a few more petals have been added to the centre of the flower, or rather a few stamens modified or converted into petals, by operating in accordance with the laws of morphology, which regulate such apparent freaks of nature, and now passing from the old single red to the latest hybrid additions, Mrs. Abby Wilder, Mrs. Cope, and others, we only witness the progress of the florist's operations, and do not feel surprised. And here let us enquire what America has done in this branch of art? Is she behind all others in this, as she is in some other branches of horticulture? No! here at least there is a resting place from reproach. The hybrids of her florists are distributed over Europe, and rank second to none in their various classes. Nor is she without skillful amateurs in hybridization, for Smith and Wilder have established their reputation. I need not enumerate the many valuable varieties which have originated with our florists, they will be spoken of under another portion of the subject. America, indeed, vies with Italy, as the country for the Camellia.

Before taking leave of this subject, I will express my regret that to a large portion of the humble admirers of flowers, the Camellia is as yet unknown as much so, perhaps, as if it still depended for introduction to the success of the famous Japan Expedition. Unlike the plebean rose, it is the special favorite of the rich, whose means of gratifying their tastes limit them to the gifts of nature, profusely scattered along the highways of their native land. Though more in Republic America than in any other country, has such a barrier been removed; for here the humble sewing girl without any great stretch of liberality, is at times presented with a Camellia to ornament her hair at the ball; yet, what class so much as the operative, would profit by the influence of flowers.

Happily, what is considered beyond the duties of a parental government to secure for the mass of the people, the liberal merchants provide and freely permit their less fortunate fellow citizens to enjoy. When, however, it shall be considered proper to provide suitable gardens and conservatories for the people, they will be consulted in the matter and not peremptorily taxed, as are the working classes of old monarchical countries, and then forced to beg admission to them under certain conditions. When New York opens a public garden it will belong to the people.

Green-Houses.

The principal distinction between a green-house and conservatory is, that in the former, the plants are exhibited upon shelves and stages, while, in the latter, the plants are generally planted out in a bed in the middle of the house prepared for their reception. In many instances, however, there is no other distinction than in the name; as these structures are sometimes so arranged that the middle portion is appropriated to the growth of larger specimens planted out, while the sides are surrounded with shelves for the reception of plants in pots, as in a common green-house. And to this arrangement there can be no special objection, especially where the structure is of small dimensions, which admits of the sides being shelved for plants in pots, without destroying the character of the house, or the plants, by their distance from the glass. We have seen a few instances, a very few, where the two characters were amalgamated together, forming a most interesting conjunction; but, unless the specimens exhibited be very large and well-grown, their effect, when situated upon the centre bed of a common-sized house, surrounded with shelves, is meagre and defective in the last degree.

Properly speaking, a green-house is not a receptacle for large plants, and hence it should have adequate means within it for placing the plants at a proper distance from the glass. This is absolutely necessary with regard to those classes of flowering plants that are fitted to adorn it, both in winter and summer. Some are of opinion that green-houses are of no further service than merely to store away a miscellaneous assortment of rubbish during the months of winter, for the obvious purpose of preserving them until the next summer, that they may turn them out under trees, or in out-of-the-way corners, to keep them from being burnt up by the hot summer sun; and, as a matter of course and of custom, the green-house is converted into a lumber-room, or something else. And

there it stands! what is, or ought to be, the chief ornament of the garden, deprived of its character, for want of taste, and divested of its interest, for lack of skill! Visitors say, "Let us have a look at the green-house." "No," replies the gardener, apologetically, "it's not worth your while going in, for there is nothing there to see!" A humiliating acknowledgment, but full of truth.

It is foreign to our purpose to enter upon the present condition of green-house gardening, and the manner in which these structures are managed by gardeners. Our present object is to treat of their construction, and of the means of adapting them the most easily to the culture of flowering plants, either during winter or summer.

It is a well known fact, that plants that are grown in what are called lean-to green-houses, have exactly the character of the house in which they are grown, *i. e.*, they are one-sided; nor is it possible, without a vast amount of labor and attention on the part of the gardener, to grow them otherwise. In this respect the cultivator does not imitate nature, but rather the monstrosities of nature. Trees and shrubs only grow one-sided when their position precludes the access of light and air around them; but they grow naturally into a compact bush, which is universally allowed to be the most beautiful form that plants can assume.

Even a handful of cut flowers have their beauty, and are generally admired, but when seen upon the living plant, whatever shape or form the latter may possess, how much greater their charms! If, therefore, we add to these natural beauties the additional charm of a positively beautiful form, surely it will double their claim to our admiration. And we may here add the gratifying fact, that this claim is now generally recognized by all who can appreciate the superior beauty of well-grown plants.

The principles upon which plant structures ought to be built, are somewhat different from those which regulate the erection of forcing-houses, culinary houses, &c., and as their purposes are different, their shapes and forms are generally also different. Plant-houses admit of a greater variety of shape and design than any of the kinds previously mentioned, and as they are generally erected in private grounds, for ornament and display, they should have a more artistic character than the others.

The size of the green-house may vary according to the extent of the collection to be cultivated, but it should always have a length proportionate to its height and width. There is a great inconvenience in having the green-house very capacious, and where it is desirable to have a large collection of plants, it is best to have a conservatory for the growth of the larger specimens, or a stove for the palmaceous families of plants. We shall, however, allude to what is properly termed the green-house.

A first-rate green-house should be completely transparent on all sides; lean-to houses are decidedly objectionable, for the reasons already given. Houses that are only glazed in front, and have glass roofs, but otherwise opaque, are also objectionable, as plants can never be made to grow handsome. They become weakly and distorted by continually stretching towards the light, neither do they enjoy the genial rays of the morning and evening sun, and only perhaps for a few hours during midday. If such houses be large and lofty, they are still more unmanageable, as no culture can keep the plants symmetrical and of good appearance.

A green-house should stand quite detached from all other buildings, and may be of any form the fancy may dictate or the position suggest. It may be circular, oval, hexagonal, octagonal, or a parallelogram, with circular or curved ends. The house, to be proportionate, should be about fifty feet in length by twenty in width, and fourteen feet high, above the level of its floor; if more effect be required from the external view, its parapets may be raised, to give the house a loftier appearance. The parapet should be not more than two feet high all round, the upright glass about two and a half or three feet more, including base, plate, and sash bars. The house should be surrounded by a shelf, two feet wide, level with the top of the parapet wall. This shelf is of great importance to a gardener, and is generally the best place for the finer kinds of plants; being surrounded on all sides with light, and being near the glass, they grow bushy and dwarf in habit, in which state they are most pleasing and attractive. Next to this shelf comes the pathway, three feet wide at least, (having just enough room between the roof for the tallest individual to clear the glass and rafters;) then the stage, or centre-tables, of stone or timber, and arranged according to the size of the plants to be grown. If desired, it may be made to assume something of the character of a conservatory, by introducing a ground bed in the centre, instead of the shelves or tables. The fire-place and heating apparatus may be placed at one end, and under ground, so as to be out of sight, or may be formed in a sunk shed, and blinded with

shrubbery. The flues, or pipes, for warming the house, must be carried round, beneath the side shelves, dipping below the level of the floor at the doors, and returning by the opposite side of the house to the furnace. The cost of such a structure will very much depend upon the quality of the workmanship, and the material used in the construction; but we think a very good house may be erected, according to the foregoing plan, for about ten dollars per foot in length, or about five hundred dollars for a house 50 feet long by 20 feet in width.

Such a green-house, though plain and inexpensive in its character, may, nevertheless, be made to harmonize well with flower-garden scenery, and is far superior to the clumsy, shedlike erections, frequently seen stuck into corners of buildings and dwelling-houses, without reference to the position of the structure, or the purpose for which it was built.

This house may be placed in any situation, as regards aspect. It may be attached at one end to any other building, without much injury to its efficiency as a plant-house; and where it is found absolutely necessary to attach green-houses to the walls of other buildings, they should, by all means, be constructed after the plan here given, or under some architectural modification of it, avoiding, if possible, that old, and now almost obsolete system, of laying the roof up to the wall, as in a common grapery, or of making the front of heavy pilasters and massive wood-work, like the orange-houses of the middle ages. The method of construction here described is that in which the plants enjoy the largest share of light; and this house is the easiest managed—with respect to air and heat in winter, and moisture and shade in summer—of all other methods which have come under our experience.

One of the leading errors in the erection of large plant-houses, is in the unreasonable height to which their roofs are carried, and which in the case of palm-houses may be defended as necessary; but in the case of conservatories, there is no tenable justification of such a course, except the house is intended to be the object of admiration, instead of the plants that are grown in it; and if fitness for the end in view be expressive of beauty, then, after all, these architectural temples must decidedly fail in producing that effect upon the mind, that the plain finished, but fitly and efficiently designed structure never fails to produce. But the beauty, even of the plainest kind of structures, may be easily heightened and increased by an ornamental moulding of wood along the ridge of the roof, if a span, or on the end rafters and front plate, which will deprive the house of none of its lightness, and will give it a neater and more elegant appearance.

Plants placed at a distance, either under water or under glass, are as much influenced in their development by the light as by the heat. When plants are a great distance from the roof, they are, of course, in a colder and denser medium at the surface of the soil than at the top of the house, and there cannot be a doubt that this difference in the density and temperature of the atmosphere has much to do with the struggle and effort which every plant makes to rise upward, and to elevate its assimilating organs into the warmer and most humid regions of the house. It will also be found that the difference betwixt the higher and lower strata of air in hot-houses, is more immediately the cause of plants drawing, and becoming weak, than anything that results from a feeble constitution, or from a deficiency of atmospheric air.

Notwithstanding the practical illustrations of this prevailing error in plant-houses, there seems to have been very little done to counteract this fault in lofty houses. The large conservatory in the Regent's Park, Botanic Garden, is the only structure of great size where this circumstance has had sufficient weight to induce the erectors to provide against it, in the general design and construction of the building. This admirable plant-house stands as a striking illustration of what can be done on a grand scale, without rendering fitness for the end in view subservient to architectural display, and yet, without depriving the structure of that dignity and effect which fine conservatories always convey to the cultivated mind. This conservatory, we believe, is the result of well digested practical and scientific knowledge, and we doubt if there be any other such erection in England, where the effect of this rare combination is so strikingly displayed on a scale so magnificent; and the result of this combination has indeed been clearly manifested, in the formation and subsequent management of this beautiful garden.

As the influence of the upper and lower strata of air, in large houses, will be discussed in a subsequent portion of this work, devoted to that subject, we will not enlarge further upon it at present, more than to observe, that lofty-domed, or curvilinear roofs, as that lately erected at Kew, are more difficult to manage, both in winter and summer, than low-roofed houses, whether curved or straight, and that the impossibility of rendering these houses in any way workable, has induced, in some

instances, their almost entire abandonment on the part of the proprietors, owing solely to the intense heat of the superior regions of the house.

The most experienced and enlightened men have satisfied themselves, that structures in which the atmosphere has to be kept at a higher temperature than the external atmosphere, and in which plants have to be grown, should be kept at the very lowest elevation which the use and purpose will admit, so that the temperature of the air, at the level of the floor, and among the roots and lower portions of the plants, may be as little different as possible from what it is in the higher regions of the house; by regarding which, the house will be much easier kept during summer, with respect to air and moisture, and, during winter, with respect to a more equal diffusion of heat.

In the comparatively still atmosphere of a hot-house, when all is closely shut up in a cold winter's night, the difference betwixt the temperature of the atmosphere at the surface of the floor and the highest part of the roof will generally be in the ratio of one degree to every two feet of elevation; thus, in a house 20 feet high there will be a difference of 10 degrees. This ratio, however, is not absolutely correct, as we have proved by experiment, in houses of various sizes, which give, under certain circumstances, a greater difference of temperature than here stated, as will be shown when we come to treat on this branch of horticultural science.

We have already said enough on this point, here, to show the advantage of erecting low-roofed conservatories, especially when the object is to grow the plants in beds, or masses, irregularly placed on the level of the floor, which is decidedly an improvement upon the old method, of having a few long-legged and branchless specimens sticking their heads up to the glass, where their leaves and flowers are far above the common axis of vision, and where nothing is seen below but the monotonous bed, and the bare stems of the plants that are growing in it, compelling the gardener, at hazard of propriety, and in violation of every principle of taste, as well as of his own judgment, to stick in the commonest plants, whatever they are, among the bare stems of the others, to fill up the unsightly blanks and vacancies thus occasioned in the beds.

While on this subject, we will just briefly remark, that nothing has so much tended to improve the culture of the trees and shrubs, generally grown in houses of glass, as the improvement that has taken place in the mode of construction. All practical men are agreed on the point, that, to grow plants well, the house must be low in the roof, and light as well as air must be admitted freely to every part of the plant, from the ground to the glass. They must also be situated in such a way, regarding their lower parts, that the light may not be obstructed, for however powerful, and perhaps sometimes injurious, the fierce rays of the mid-day sun may be in mid-summer, yet its permanent obstruction is far more so. It is easier to obviate scorching in the one case, than etiolation in the other.—*Leuchar's Treatise.*

Plants suitable for Grouping in Flower Gardens.

Grouping, or arranging showy plants, en masse, has of late years become so general in all good gardens, that we are somewhat surprised some efficient person has not attempted to give practical instructions, so as to insure a succession of beautiful flowering plants for this purpose. Although the system has become almost universal, it is we conceive, but imperfectly understood.—The following hints are the result of our experience in the management of this style of flower gardening, and should they be the means of facilitating or elucidating any thing connected with the subject to any of our readers, we shall feel most happy; they apply to flower gardens with small detached symmetrical beds, whether formed upon grass (which is the newest style) or gravel; and as one or two shabby or declining beds spoil the whole effect, the earliest opportunity should be embraced to refill them; to do this throughout the season, with the least possible expense and trouble, is the object to be attained; for this purpose, a reserve garden, some frames or pits, practical skill, and considerable attention, are requisite; these for the most part depend upon the experience and perseverance of the gardener, for although many good practical works upon gardening have been published, the rotation of crops for the flower garden has generally been but indifferently treated upon, whilst the kitchen garden minutia are elaborately explained; in fact, until the last few years, flower gardens were for the most part a mere secondary object, as far as regarded management; whilst, if the old works on gardening are examined, it will be found the kitchen garden was cropped

much the same as at present, and produced vegetables as good and in as great variety (with the exception of a few introductions of minor importance). The principal things in the flower garden were such as annual lupins, thrift, double feverfew, bachelor's buttons, honesty, &c., with some bulbs, and those planted almost indiscriminately, without reference to height, color, or duration; there were none of the petunias, dahlias, verbenas, calceolarias, eschescholtzias, and dozens of other equally elegant plants that adorn so beautifully our borders and beds at the present time; not that we would wish to exclude their less gaudy brethren, but the flower garden beds should at all times be as dazzling as possible, whilst the borders might be occupied with the miscellanies. There are some who advocate beds with mixed plants, which, when arranged according to their heights, colors and seasons of flowering, look very well when properly attended to; and to those having little room and desirous of possessing a large collection, they have their recommendations; still they never have that striking effect the same beds would have if filled with suitable plants, arranged in groups, and in large flower gardens we think them decidedly bad; and as there are continually some shabby or decaying plants, the same or even a greater objection, may be made than that of declining beds in the grouping system, as the opening made by cutting down a permanent plant cannot be conveniently filled until again occupied by its dormant possessor. Take for example, any of the botanic or physic gardens, where herbaceous and other plants are arranged according to their genera or order, and contrast them with a flower garden managed upon the best acknowledged principles of grouping, and we do not hesitate to say this will be sufficient to cause many to become converts to what we recommend. What we have just stated respecting public gardens was merely given as an example of the general effect produced by plants mixed indiscriminately, and not to insinuate, as might be supposed, that these arrangements are wrong or incompatible with such institutions; we know to the contrary; neither do we suppose that botanists would consider a flower garden managed as we propose, so fraught with interest, notwithstanding which they would certainly acknowledge the superiority in general effect and beauty; but these are not the objects sought after by scientific men, who, with microscopes, examine and admire, with as much satisfaction, a new form of lichen or moss, as others would a bed of roses; indeed so changeable are the tastes and fancies of human nature in general, that anything called new and beautiful to-day, will probably in a short time, be termed only pretty.

The most beautiful plants and colors cease to be interesting or charming to the eye when they have become familiar, or, at least cease to cause the usual emotions felt at seeing any new or beautiful form; in course of time, we view them with the same indifference as we do the most common things or colors; we propose to obviate this by grouping the most approved colors in beds, changing their position at every rearrangement, which would in some instances occur thrice in the season, and thus the monotony of seeing the same plant spring, flower and die, would, we conceive, be in a great measure remedied.

We may now mention such plants as we have found most suitable in the earliest months of the season. The varieties of crocus, *Helleborus niger*, Christmas rose, and the blue and white Russian violets are among the first harbingers of returning spring. Edgings of crocus particularly where the garden is in the geometrical style, are in our opinion preferable to filling any of the beds entirely with them; they should be planted in September, when taken up, which need not be oftener than once in three years.

Groups of the following may be had from January until April. *Helleborus niger* should be planted from the reserve garden, either in the autumn, when some of the beds have become vacant, or just before flowering; they should be taken up immediately after flowering, which is the time for their propagation by division of the roots, and planted in good soil until again wanted.

Russian violets, single white and blue; may be treated in the same manner.

Hepaticas, blue and peach blossomed, *Primula acaulis*, the red, white, and puce colored varieties, may be treated as recommended for *Helleborus*; a shaded part of the reserve garden should be chosen for the last two, or close under a north wall in the kitchen garden, which is generally unoccupied.

Viola tricolor (as recommended in a former number) *Draba nivalis* makes a beautiful white mass, and may be planted just before flowering without injury; it is propagated in May by cuttings, under a north aspect.

Aubrietia delloidea matches the above for height, is lilac, and may be propagated the same way, or by division.

Ajax pumilus should be planted in September, or even when in flower; they will move exceedingly well without injury.

Erythronium dens-canis, red and white, makes a beautiful bed, and when the flowers are past, the leaves are exceedingly handsome; may be managed as *Ajax pumilus*.

These with *Coronilla olauca* and Neapolitan violets brought forward under cover, and planted out in March, giving them slight protection during frost, early tulips, hyacinths of colors, narcissus of sorts, anemonies and beds of some autumn sown hardy annuals, as Nemophila, Clarkia, Collinsias, will be found sufficient crops to make flower gardens look better and gayer than they generally do at an early season of the year.

Anemonies, if marked the season before, might be made to fill several beds with different colors, red, white, blue &c.—*Pax. Bot. Mag.*

Green-House.—During severe weather keep the temperature as steady as possible. Never leave the sun heat above 50 degrees without air, and even at that temperature but a few hours without it. Fire heat should never be below 35 degrees nor above 45 degrees. A collection of cacti requires 40 degrees at all times. Do not keep the house without air at any time more than thirty-six hours; it is even better to use some fire heat, than to omit giving air. Hyacinths should be kept near the top glass.—*Working Farmer.*

Wintering Half-hardy Plants.

There are more prospects for a lucky hit at keeping half-hardy flower-garden plants this winter than we have had for years past, and, therefore, the more stimulus for us all to push our practice in this department farther than some people could dream of years ago. Old specimens of all plants for the flower-garden are most useful in May, and every plant that can be saved from the frost should be looked to at once; damp is more to be dreaded, however, at this early season, than frost; see, therefore, that none are crowded into damp pits at first taken up; a certain degree of dryness is essential now, whether plants are potted or merely kept loose in their balls, so that sheds and outhouses are more useful just now than closer quarters. I have cut off every one of the old leaves from all my own Scarlet and other border Geraniums, and I have close pruned many of them, all but the strongest shoot, for training them into pyramids another season; then, after cutting back the roots a good deal, I got as many as eight two-year-old *Tom Thumbs* into No. 16 pots, and adding one-third dry sand to good mellow loam in a dry state, I was able to shake it well among all the openings between the roots, then a good watering, and exposure under the walls of the garden, with mats stretched over them at night. Here I shall keep them out as long as it is safe, and meantime they will ripen better, make young roots, which can work very freely in the sandy compost; and those of them which I must keep dry for want of room, will be better able to bear it than by any other means known to me. I shall not let the soil get quite dry about them before Christmas; in the meantime, I must look over all their wounds two or three times, and cut off a little here and there, wherever I see symptoms of decay. Nothing is more dangerous during the first two months, after much pruning at this season, than the festering of wounds at the ends of soft branches cut off, and the only remedy is to cut back a little to the quick again and again till the parts are dry and firm. Ten days ago, I cut back all my older Geraniums quite into the hard wood, not a leaf was left; the roots were also closely pruned. I put them in by the heels in sandy soil, rather moist, and in an outhouse, where I can cover them over with mats, and keep a smart frost from them; they are beginning to root famously already; their heads will be as dry as faggot-wood before I shall have put them down in the cellar, and then a little moist soil about their young roots will keep them fresh all winter without damping the hard branches.

These are the sorts of plants to keep plunged in pots all next summer, where Geraniums go too much to leaf, and do not flower so free on that account; depend upon it, we have a good deal to learn on this head yet. I never needed to plunge pot-plants at Shrubland Park; the situation is so dry and airy, that all plants flowered better in the autumn than at any other time; but I well recollect, the last year I was there, I had to make up a bed under the Albert Tower at the end of June, with pot Geraniums in full bloom; they were all odds and ends, some young, some old, and some very old indeed; but the very oldest answered best, and some of the best looking, at first, being the youngest, did not turn out so well as I expected. After the first flush of bloom was over, the rest was not much to boast of in comparison to the old stumps, which most people would be afraid to venture in one of the most conspicuous situations about a place, but that bed opened my eyes to the value of old Geraniums, and if it had not been my lot to be at work near the sea, on the west coast of Argyleshire, whence we had an excellent communication this very day from "A Lady," I should keep every morsel of my very oldest Scarlets, and prune them just as close, top and bottom; as I have just said, keep them out of pots all the winter, very dry overhead, but with a little moisture round the roots the whole winter; towards the end of March I would pot them singly in 32-sized pots, and in a very rich soil, keeping the roots as low down in the pots as I could cram them, as plunging over the rims would be sure to entice the roots to rise to the surface, rather than seek their way through the bottom-hole; and if I did not have a better bloom of Geraniums next autumn than was ever seen on the coast of Morven before, I would never roun the Mull of Kintyre again for Geraniums, or anything else in the gardening way.

I think I have already told of *an old Geranium* I have with a stem as thick nearly as my wrist, it is now nine years old; and last year, in September, I cut it as close as I dare without actually killing it, and I declare I got it comfortably into a 48-sized pot, which it filled with roots in less than three weeks; I then put it into a 32-pot for the winter, and in March I shifted it at one jump into a No. 12-pot, in which it bloomed as no Scarlet Geranium ever bloomed before. I intend to keep this plant as long as I live, for two reason; the first is a private consideration which affects no one but the owner; the second is to prove to the gardening world that any one of the Scarlet breed of Geraniums can never be too old to bloom extraordinarily well, provided it is managed well; but there is nothing new in the idea; I heard it asserted just twenty-nine years since, by one of the best growers of the tribe in those days, the late Lady Cumming Gordon of Altyre, in Morayshire, who was the first to plant flower-beds in masses of one or two kinds.

I never tried, or saw the plan of hanging up Scarlet Geraniums in the cellar, but unless the cellar is damp naturally, I see no reason why old Scarlets thus prepared should not keep by thousands that way. At all events, I am satisfied that we shall never succeed in keeping our bedding Geraniums in a dry state over the winter, except as by mere chance, until we learn the proper management, and the value of old plants of them; and I forsee the difficulty that must always attend our experiments in flowering beds of them in plunged pots, until we learn and acknowledge the fact that a Scarlet Geranium can never be too old for a flower-bed; but I forgot to mention one of the best properties of my nine-year-old plant, which is, that the leaves are now only about half the size they were when it was a "seedling."

Well, talking about seedlings never tires one either. I have a thousand of them at this moment, and many not up yet. I sowed the last batch in the middle of October, and, as I never think of transplanting seedling Geraniums in the autumn, I hit upon a plan this season which, it seems to me, will answer remarkably well. A full ear, or beak, of Geranium, carries five seeds. As soon as the covering of the seed begins to change color, I cut it off a little below the *torus*, or thick part to which the seed is fixed, and sow it, the same day, close by the side of the pot. The whole of the beak stands out of the ground; so that, if I do not have enough to fill *round* my pot today, the upstanding beaks will show me where to begin *planting* my beaks to-morrow, or whenever it may be. I allow two inches from one beak to the next—at least I ought to do so; but really, when one has so many, there must be exceptions to general rules now and then. The best size pot is the 48. If all is well, five little seedlings rise, in a lump, from each beak, or head of seed; but they are entirely free from the others, and their being so close together, and in contact with the side of the pot, they assist to drain better than single plants, at nearer intervals; besides, a pot holds more than double the quantity of seedlings in this over the usual way; and, if one or two out of a five-plant patch dies in winter, there are still three chances that each crossed flower will give a seedling, which is the greatest comfort of all.

By-and-by, the seedlings will touch one another all the way round; but that is no hurt—if they do not meet their leaves across the pot all will be right enough; but early-sown ones will meet across a 48-pot occasionally, as early as October; but no one in his senses would transplant them at that season, unless, indeed, he had a strong dry heat for them; and if he had, he might pot off seedlings of any Geraniums all through the winter with little risk. Now, the plan I have adopted this season, for the first time, is to obviate this difficulty—seedlings covering the whole top of a pot. Gardeners may also find the plan useful for stove pots of tender cuttings, and other things; whatever the size of the pot, cover it with a bell-glass that will leave sufficient room for the row of seedlings, or stove cuttings, between the edge of the glass and the side of the pot, the inner leaves will then lean against the dry outside of the glass, and never damp, or cause dampness to the soil. The pot will not require a quarter of the attendance in watering and looking after it; the moisture which rises from the soil is condensed on the inside of the glass, and trickles back again, as in a Wardian case, so that the little space of free soil in which the seedlings stand need seldom be wetted at all, and I am sure the plan may be applied in different ways with economy; but I shall report on it again. I am highly pleased with my last year's seedlings, but as I am on quite a new track I have little more to say or boast about. My best White, of the Horse-shoe breed, had ninety-six flowers on the only truss I allowed to come; this will beat, by fifty or sixty flowers, any truss of pure white which we have yet seen; but the bother is, out of fifty-seven pure white-flowered seedlings, not the smallest improvement is perceptible in the *substance*, or *shape*, of the individual flower. Perhaps we shall have better luck next time. In pinks and purples of the same breed I am the richest man near London, at any rate; but here, also, nothing is yet good enough to keep up the old credit of my shop and firm; but better times are coming for us all.

[I know of no more agreeable occupation for an amateur gardener than hybridizing different varieties of plants, and growing new varieties of seedlings; whether of Geraniums, Roses, or other flowers or fruits. The suggestions made in this practical article are full of practical value, and have been written by one who is abounding in real knowledge, which is of the most reliable kind, for he has gathered it from the spade and trowel, in the border and potting-shed, and illuminated it by sensible rumination.—Ed.]

Garden Balsam.

There are few who have any taste or convenience for the cultivation of ornamental flowering plants, that do not bestow some pains, and in some instances much labor, on the growth of the balsam; and it cannot be said but in every instance where, any thing worthy of the name of treatment is resorted to in its growth, that the produce of bloom is an ample compensation for the time wasted therein; although with one grower the show of bloom doubly surpasses that of another, yet it is well known that this degree of superiority can only be in exact proportion to the application of the improved modes discovered in cultivation. The balsam when brought to bloom under ordinary treatment is a beautiful object, but when grown in that superior manner, as exhibited at some of our leading Horticultural shows, with the leading stem wreathed in blossoms of various beautiful hues, often to the height of four or five feet, with proportionate branches thickly set from one end to the other, with large, full-blown flowers, so as to form a conical figure of considerable circumference, and which, on the stage among the exhibited treasures, for a grand display of bloom is not outvied by any of its neighbors, although by many of them in real valuo. From the many modes of cultivating it, we select one which we have proved to be successful. The balsam is a native of the East Indies, consequently must have a degree of heat above the out-door temperature; when the plants are young this is particularly necessary, for they seldom or never attain any size if they are not brought, while young, into a tolerably brisk heat. Sow the seed some time in the early part of March, in a wide mouthed pot, observing to divide it thinly over the surface of the soil, after which cover it lightly with mould to the depth of an inch, then plunge it about half way in a free-heating hot-bed, and in a short time the young plants will have made their appearance; and when they have fully developed their seed leaves, by which time they will have made young roots, they should be transplanted singly into large sixties, and

the pot replunged into the dung. In the course of a week the roots will have reached the sides of the pot, when they should be immediately repotted into forty-eight sized pots, and again replunged. In a week's time again examine the roots, and if they have penetrated the new soil, repeat the operation of shifting, and so continue until they finally reach a size measuring no less than ten inches across. During their whole progress they require a liberal supply of water, and to be kept constantly in the hot-bed, or a warm damp stove. The soil for them should be equal parts of loam and leaf mould, with a trifling addition of dung; these portions well incorporated, but not sifted. Plants thus treated, attain the height of three and a half or four feet, measuring twelve or fourteen feet in circumference, with branches from top to bottom, and these covered with fine well blown double flowers. One thing tending to weaken the plants and render them unsightly is, their liability to be overdrawn in so humid an atmosphere, which can only be obviated by placing them, at all stages of their growth, as near as possible to the glass; if this is attended to, the plants will not only be fine, but the flowers much better. A method of propagating balsams from cuttings is given by G. J. Towers, Esq., in the first volume of the Horticultural Register, page 397, as follows: "In the month of April I received a packet of seeds of the balsam from a friend, whose son had produced them in the preceding year, at Madras, and forwarded to his father. The seeds were, to all appearance, most perfect in their texture and state of maturation; and, I believe, that of all I sowed, scarcely one failed to produce a lively and healthy plant. I sowed the seeds in a pot of light, sandy earth. I plunged the pot in the earth of a meloury, which was a glazed pit, containing a bed of leaves, chiefly oak and beech. The pit was constructed, on three of its sides, of nine inch brick work; the fourth, that to the south-west, having a glazed sloping light. The bottom heat of the leaves, at the depth of twelve inches, might be about eighty degrees; but as a stratum of melow earth, full fourteen inches thick, was placed on the leaves, the heat at the bottom of the pot scarcely exceeded sixty-four degrees. The young plants rose, were potted out, repotted, kept near the glass, and finally kept in the open air, according to the customary routine: still, however, they evinced (with one exception only) not the slightest indication of producing blossom, although some had attained the height of three feet or more. At the close of the month of August, I became impatient, and as I felt interested in the final result of my exertions, I determined to try how far I might be successful in an endeavor to extend the period of the growth of my plants into a second year, by attempting to propagate them by cuttings. My direct object was, as it is stated, to convert one of the members of the plant into a perfect vegetable body, possessed of roots and capable, under auspicious circumstances, of exerting its various vital functions throughout the winter; and finally, as I hoped, of producing perfect flowers and seeds in the ensuing spring. On referring to my diary, I find, that on the 28th day of August, 1831, one cutting was placed under a glass, such as a tumbler or small bell glass. This cutting was about three inches long; it was taken off at the axilla of a leaf, that is, at the angle formed between the foot stalk of the leaf and the main, or other principal stem of the plant. The soil in the pot was composed of very light sandy loam and peat earth, and the pot was immersed in the mould of the meloury. This cutting evinced certain signs of the formation of perfect roots, on the 12th of September, and on the 18th, four other cuttings were placed in a similar situation; all of them succeeded, and each became covered with blossoms, though it was scarcely four inches in height. On the 12th of October, the cutting of August 28th was eleven inches high. The stem was somewhat slender and drawn up, owing to the absence of sunlight, but it was furnished with nine perfect semi-double-flowers, the ground color of which was a pale French white, and this was beautifully striped with a deep pinkish scarlet. When witnessed the unexpected result of my

experiment, I communicated it in a paper addressed to the Horticultural Society, without delay.

It remains only to remark, that balsams may be forced into flower at the close of the autumn; that the cuttings of the young shoots at the axilla, or angles of the leaves —at the length of two, three, or four inches—will almost invariably produce rooted, flowering plants: provided they be placed singly, an inch deep in small pots of light rich earth, and then plunged in a very gentle bottom heat, under glass.

These are horticultural facts, which I believe to be decidedly established; and I also consider that in all probability such plants—if every flower bud be timely removed—can be preserved through the winter in a dry stove, or well-aired and warm green-house. I am not, however, enabled to speak unhesitatingly on the latter particular, because I was not prepared to afford the desired shelter during November and the early part of December; as my house was in an unfinished state, and the pit in which the young plants were placed was far too much exposed to early damps and hoar frosts. I have fully succeeded, however, in securing a succession of other tender, herbaceous, and annual plants, by cuttings taken off in September or October; among which I may mention, particularly, one of the *Coreopis Tinctoria*. This is now as fine and healthy a young plant as I ever beheld. I only wait for a favorable opportunity of prosecuting my inquiries, in order to furnish that information which may enable other horticulturists to extend their researches, which if pursued with patience, and in a spirit of true philosophical investigation, may, at no remote period of time, lead to discoveries as interesting to the lovers of science, as they will be gratifying to those whose chief object it is to add to or extend the beauties of the green-house and flower-garden.—*Pax. Bot. Mag.*

[The attention of our gardeners need not be directed to this matter of cuttings, but many amateurs will be glad to learn that they may thus perpetuate some favorite or fancy variety that they may have originated.—Ed.]

Hints to Young Gardeners on Mental Improvement.

Subordinate only in importance to observation itself, is a knowledge of the readiest and most profitable manner in which it may be conducted. To afford a hurried sketch of the system we ourselves have practised, these present endeavors will be directed. What is deficient in detail, or but imperfectly connected, we leave to the adroitness of our youthful readers to elaborate and supply; only premising that, to ensure the attainment of its advantages, it must be perseveringly and indefatigably pursued, and promptly and judiciously applied.

Of all subjects of information, that most useful to the gardener is the effect and extent of the agency of the elements, processes, and phenomena of Nature upon vegetation. The cultivation of plants, whether of an ornamental, culinary, or otherwise useful character, being the principal aim of his profession, and the treatment of these having to be regulated according to natural circumstances, will account for the importance we attach to this comprehensive particular. It being almost impossible for the memory to preserve a faithful register of daily revealed facts and circumstances, we must commence by suggesting the use of a diary, wherein to record the occurrence, consequence, and, as far as practicable, the cause of any remarkable incident, either directly horticultural or relative thereto, with notices of such newly-presented feature of, or deviation from, the ordinary course of culture and development, as may be deemed worthy of remembrance. To the slothful, we are aware that this practice is open to insuperable objection;—but it is not such we address;—and the highly beneficial effects of the habit, which speedily manifest themselves, will be a sufficient stimulus to the aspiring gardener.

Diurnal changes of temperature, of humidity, and of the general state of the atmosphere, not forgetting winds and clouds, will form matter for some of the items of such memoranda; and though these are uninteresting and unsatisfactory in them-

selves, yet, when noted with a view of ascertaining their influence on vegetable life and functions, they will be invested with peculiar and permanent inducements to proceed. It has been the failing of those who have commenced such accounts, usually to neglect that which alone can render them either gratifying or useful; hence, they have soon become weary of the task. We would wish it to be distinctly understood that no recorded observation of any kind can be of the slightest value, unless accompanied by the influence and issue of the circumstances investigated. Connected with atmospherical phenomena, as being the means by which many of them are modified, and which in turn exercise a considerable reactive agency; there are a variety of compound matters, termed soils, the diversified effects of which upon plants, is too powerful and evident to be passed over by the observant gardener. Whether they are only the medium of conveyance for aqueous and gaseous fluids, or whether as is more probable, indeed, well authenticated, they impregnate those fluids with their own particular properties, to the sustenance or injury (according as they may be inimical or congenial) of the plants growing on them, their influence must be of the highest moment. On the first assumption, a knowledge of their capability of admitting the percoration of fluids, and in the second, besides this, an acquaintance with their chemical qualities should be sought by those who would understand correctly how to employ them. Analysis of their constituent particles, though not so easily obtained, are much more satisfactory and conclusive than a mere examination of their general appearance and consistence, and every gardener should be in some measure competent to this operation. The adaptation of the different soils to particular plants must, however, be the ultimate object of such observations.

Ascending still nigher in the scale of natural influence, there is a class of animated beings, which is included in the term insects, whose ravages upon plants it is impossible for the most negligent gardener to disregard. And yet, how little is generally known of those interesting, though destructive tribes. It is our special privilege, that many departments of knowledge which the elegant and the erudite traverse as amateurs to acquire delight and wisdom from their investigation, are those with which our calling permits, nay requires us, to acquaint ourselves; and of these Entomology will be found certainly not the least remunerative, either in imparting real pleasures or professional advantages. When it is reflected that few are familiar with the transformations, seasons and sustenance of the more inscrutible, but not less inimical species, and that many frequently confound or fail to trace and identify, through their various metamorphoses, and in their dissimilar guises, those which are larger and more conspicuous, it will be seen how needful it is to direct attention to this important science.

Nor would inquiry into the habits of the feathered race prove superfluous. The indiscriminate slaughter and extermination of birds, is allowed by all rational and experienced men to be fatuous and impolitic. Most of them, if their numbers be discreetly regulated, are, notwithstanding temporary and apparently extensive depredations, the most efficient auxiliaries of the gardener, in repressing the far more voracious hordes of vermin that would otherwise speedily defoliate all vegetation. Apart from an examination into the influence of natural circumstances on plants, there are peculiar variations in the method and manner of treating them artificially, the applicability of which demands much and careful observation. In this instance, again, we can not refrain from declaring the inadequacy and utter futility of a mere record of operations performed, or systems commenced, without further regard to their consequences and results. We have known young enthusiasts, who very diligently kept a journal on the above plan; but in every case have they abandoned it after its novelty has subsided, and, we are confident, from no other cause than that we have before assigned. To render these observations available, not only the particular kind of soil employed, the mode of potting, admin-

istration of water, and other similar matters, must be recorded, but the construction of plant structures, including every portion of them, and the method of heating should be accurately noted. With such data, subsequent notice of the precise manner in which plants are affected by each and all of these different agents or media, will be invaluable.

We have now to advert to a subject which, of all others connected with our profession, is most grossly neglected, as the appearance of our modern pleasure gardens of every description abundantly testifies. We allude to the observation of natural scenery with a view to the impartation or improvement of an original and correct taste for landscape gardening. Far from wishing to be censorious, we state it as a remarkable fact, that not one gardener in a hundred is competent to design and execute the disposition of a garden in a manner worthy of the present, or even of antecedent ages. It is not our intention to direct the youthful gardener to the examination of hedge-rows and woods, for the purpose of learning the art of planting. These are as purely artificial as the plantations of gardens. Striking deeper at the root of the evil, we would point to the natural formation of hill and dale, streamlet and waterfall, rocky and mountainous districts, and say—are there not in these ample materials and bases for more exquisite and expressive creations of art than we are accustomed to witness in most of our artificial villa gardens? The mere sciolist may, perhaps, negative this interrogatory; but, unquestionably, the man of taste and judgment will decide affirmatively.

In referring our younger professional brethren, who are desirous of attaining respectability in landscape gardening, to Nature's School, we must do so qualifiedly. A much admired piece of natural scenery is not to be examined that each particular trait may be literally or slavishly copied. It is the outlines and not the details, the general features and not the individual objects, that we wish to be studied, so that the student may become possessed of the spirit of beauty—the *beau ideal* of grace and congruity. It would thus be impossible for him to err greatly in design or disposition; for any deformity or constraint would be distasteful and annoying to his own eye, accustomed to the lineaments of the living landscape, to the precise extent it would be inharmonious with nature. To pursue this study successfully, the mind must be unshakled by every lovely but isolated portion of scenery which might engage its attention, that the grand distinguishing characteristics of the whole may be fully grasped, comprehended and retained. By thus ascertaining some of the *principles* in which the striking variety and inequality of the surface of our globe is effected, and applying these *generally* in the formation of gardens, we are persuaded that a greater degree of originality, harmony and beauty, might be attained.

Experiments may very properly be included in our remarks on observation, since it is the investigation of their results, and not their mere institution, to which we are desirous of directing the gardening student. Observation alone must be confined to natural events; but, by experiment, new and sometimes preferable systems of cultivation are elicited, and the application of Horticultural art is simplified, facilitated and improved. If it be objected that young gardeners do not possess the means for conducting enquiries of this nature, we may reply that native plants are the property of every one, and a number of most interesting experiments might be performed upon these, by which the general functions of the vegetable system could be satisfactorily ascertained. We will only add that inquiries of this, as of a higher order, are highly worthy of the experimenter, and personally and publicly beneficial; that they betoken true genius, increase both the resources and uses of information, and invariably tend to the discovery and establishment of truth.—*Pax. Bot. Mag.*

Beau Sejour, Guernsey.

Being in Guernsey during the past week, I availed myself of a portion of the time I had to spare to visit some of the pretty gardens in that Island, and, amongst others, I visited that at "Beau Sejour," near the New Ground, and within a few minutes

walk of St. Peter's Port. I was sorry to find that the proprietor, Harry Dobree, Esq., was breaking up his establishment, and that the property was about to pass into the tenure of a gentleman, who, though passionately fond of flowers, is not likely to apply himself with so much earnestness to the cultivation of bulbs as his predecessor; a department in floricultural science for which these gardens had been famous in the production of new and good varieties, &c. The *modus operandi* of the retiring occupant had been of such a systematical character as to be productive of the most pleasing results. Many of the most beautiful seedling *Ixias* have been raised and cultivated here, and it is to be hoped that the present possessors of the stock will continue their cultivation in the same improving style, so that, eventually, we may have the varieties of that pretty genus as extensive in styles of growth, seasons of blooming, shape of blossoms, and variety of colors, as any of the other genera of bulbous rooted plants.

Apologising for the valuable space I am occupying in giving expression to my doubts and hopes respecting futurity in matters with which I am indirectly interested, I will proceed to the object I had in view when I commenced writing this paper, viz: That in the garden, at this place, I had the pleasure of seeing a fine plant of *Tacsonia mollissima* growing without any sort of protection, and covering a space three feet wide, on a wall twelve feet high, in a southern aspect, and flowering away in the most glorious profusion, many of its beautiful, long tubed, Passion-flower-like blossoms being expanded, and innumerable buds to expand, having been planted there two years, and setting, to all appearance, the elements at defiance; and by its side was also growing a large specimen of *Bignonia jasminoides*, with thirty to forty beautiful trusses of bloom expanded on it, the flowers being much more colored than they generally are when growing in a greenhouse or stove; they had lost that beautiful transparent porcelain-like whiteness which the flowers generally assume, and were rosy throughout the petals, with the usual purple throat; they had apparently acquired their coloring from exposure, and were pleasing to look at, if for "change of color's sake" only. This plant covered a space from six to eight feet wide, on the same wall, and had, to all appearance, been established there for some years, but, upon inquiry, I was much surprised to find it had only been there two, having grown rapidly, and flowered abundantly so soon after planting. If these two plants thrive so well here, I cannot see why our floricultural friends in the southern and western counties of England should not be equally successful with them.

Abutilon striatum (*Sida pictum*, of some,) was also growing on this border, and thriving to admiration, producing its fine large vine-shaped leaves, large in diameter, and numberless pretty bellshaped flowers. I have seen this plant trained against a wall, in a sheltered situation, forming a most beautiful object. It is quite hardy enough to resist the winters of the Channel Islands, in sheltered situations, and well deserves a trial elsewhere. I think that a great many plants might be acclimatized and made to do well in the open air, if a fair trial were given to them which are given up under the impression "that it is not morally possible for them to do."

There is a splendid large double *white Camellia*, twenty five feet wide, twelve feet high, and two and-a-half feet thick, growing against the same wall, which flowers most profusely during the winter and early spring months. I believe *Camellias* to be more hardy than Spanish Laurels, and the only reason I have for not recommending them to be used as a shrub in plantations generally, is, that their blossoms are so beautifully delicate that they are injured by dews and damp, as well as frost, but the plants would not suffer in any way when they were well established.

But the climax of the whole, and the object most worthy of this observation in this garden, was a magnificent *Orange-tree*, covering about the same length, on this southern wall, as the large *white Camellia* just mentioned, and not higher than the rest, because the wall was not higher at that particular part of it, but the top branches were throwing up fine strong shoots over the top of the wall, many inches long, and which I am satisfied would have extended beyond a foot, had not the cutting wind injured and stagnated their growth. The foliage on this remarkable plant was splendid, many of the leaves measuring from nine to ten inches long, and from three to four inches wide, and of a rich, dark green color. The fruit hanging on the stem was remarkably fine, and I was informed that it ripened well, and was equal to any St. Michael's Oranges introduced, as to flavor and juiciness. This is the finest specimen of an Orange-tree I have ever had the pleasure of seeing in the open air, or even under glass, in any place I have visited. I have visited the Duchies of Normandy and Brittany, and know the Channel Islands well. I have traveled through the southern and western counties of England, and have always had "an eye" to seeing any remarkable object in the

horticultural and floricultural lines, but this excels them all; in fact, to persons feeling an interest in the adaptability of particular plants to particular purposes, or to particular localities, the plants on this wall are worth coming a distance to see.

With the exception of these few specimens there was nothing else remarkable in the gardens at "Beau Sejour." The house is an old-fashioned one, with small rooms, narrow entrance, passages and staircases, small windows, not prettily arranged, either as to external appearance or to internal comfort, *i. e.*, according to the modern views of the "time o-day."

An abortive attempt had been made to get the *Araucaria imbricata* and *Cedrus deodora* to grow on the lawn in the front of the house, but they neither of them look "first rate." Coniferous plants do not seem to grow so luxuriantly in the Channel Islands as I could wish. I do not know where to find a handsome *Larch* in either of them, and am at a loss to account for it, unless the saline particles contained in the air have some influence in the solution of the problem.

Half-Hardy Annuals.

The following are a few of the Half-hardy Annuals that are free-growers, free-bloomers, and continue to grow and flower up to the end of the autumn:

Since the days of Douglas, and others, our seedsmen are enabled to put into our hands long lists of these very pleasing plants for us to select from, and in some of these lists the sorts are marked whether hardy, half-hardy, or tender; and also the heights and colors of the flower are stated. All this is just as it should be; and some of our seedsmen mention in their lists even which are the proper months for sowing each species. Notwithstanding, many over-anxious amateurs will be busying themselves in sowing annuals in pans, pots, or boxes, without either being guided by their seedsman's list or their own books—cramming their frames, their pits, and the platforms in their little greenhouse with unsightly things that never need occupy these structures at all.

To warn our readers against this, we will observe, there are two main seed-sowing seasons with us gardeners, namely, spring and autumn; but in the case of annuals, say the months of April and August are generally the best. The August sowing to produce plants for early spring and summer bloom; and the April sowing for late summer and autumn blooming. Now, I scarcely know of a hardy annual but what will stand the inclemency of our winters as well as a Turnip, and very many of these might be raised from no other than self sown plants, to be transplanted with the dibble, or trowel, in the spring months, after the borders are dressed off· Otherwise, there is always some bye-place or other to be found in every garden to sow a few seeds of any kind, or many kinds, for transplanting at some future season.

The half-hardy kinds, of course, must remain until a proper time in the spring, and these need not be allowed to occupy the valuable space which ought to be for other things. A very slight or gentle hot-bed should be made about the second week of April. the bed may be qnite level on its surface; that is, as high at the front as at the back, and four bits of board nailed together and placed thereon in form of a common frame, so as to keep up the earth round the margin of the bed. The earth should be from six to eight inches thick all over the bed; and in this any kinds or number of kinds may be sown of the half-hardy annuals, to be covered with the common hand-glasses or an odd frame-light or two, which can be readily taken off every fine day after the plants are all up. Thus may be raised a stock of strong, healthy plants, which may then be potted off into small pots, three or four in a pot, as soon as large enough. In these pots they may have a slight protection, which is a better way to establish them for final planting out in the beds or borders than that of transplanting them from the seed-bed into their final places. The plant from the pot is already established, and no shading is required, nor any care but that of well planting in the spot where the plant is to remain to grow and flower.

Among the following kinds will be found most of those which need the above kind of treatment: The *Zinnias* may justly be considered among some of the best of them; and years ago we used to think much of the old scarlet kinds called *Zinnia tenuflora*, *Z. pauciflora*, *Z. multiflora*, *Z. verticillata*, and, of course, *Z. elegans;* but now, the *X. elegans* has given rise to so many superior varieties that one scarcely ever hears of the other species. That last-mentioned furnishes us with fine large blossoms of almost all colors, from pure white to the deepest scarlet; and no plants form more beautiful beds, or bunches, for the mixed borders, rising from two to three feet high, flowering freely during the late summer and autumn months, and delighting in a good, light, rich soil. We should never think of planting out these choice half-hardy annuals in the open beds or borders until the end of May, or the beginning of June, and then keeping a keen eye upon them until they are well established.

The *African* and *French Marigolds* are always much esteemed as being very showy plants, though they are not pleasant-smelling things. They are free growers, and very free flowerers. Of these the *Tagetes patula*, or Spreading Tagetes, which is commonly called the French Marigold, has many beautiful varieties of double and single flowers of red and yellow striped, pure yellow, deep red, and other colors. They form showy bunches in beds or borders.

Of the African Marigold (*Tagetes erecta*, Upright-growing,) are two good double varieties, namely, the double Orange, and the double Lemon-colored. These rise one and a half to two feet high, and form beautiful beds or bunches in the mixed borders.

Calliopsis, or *Coreopsis tinctoria*, is still one of the best of this family. It has two or three varieties, namely *C. tinctoria*, var., *atro sanguinea*; *C. tinctoria*, *atro Purpurea;* *C. Atkinsonei*, and *C. Drummondii*. All are delightful showy plants, rising about two feet or two and a half feet high.

Chrysanthemum coronarium, the garland Chrysanthemum, has a variety called "The new Golden," of which the blossoms are deeper yellow. The plant is a free grower, rising from two to three feet in height, and a free bloomer. Another species, called *C. tricolor*, is a much dwarfer plant, but a free flowerer, and requires the same treatment.

Catrhamus tinctoria is an old inhabitant of our gardens, now seldom seen, although it is pretty and curious. Like all the before-mentioned, it is a free grower and bloomer, rising about two feet high, and forms an interesting bunch in the mixed borders.

Xeranthemum annuum, or purple Xeranthemum is a most elegant plant. It is a kind of everlasting flower. There is a white variety which is equally pretty.—These are free growers and rising one and a half to two feet high. They are abundant flowerers, and very useful in forming nosegays.

Elichrysum bracteatum, or Yellow Everlasting Elichrysum. This is a most desirable plant, rising from two to three feet high, flowering freely, and is extremely pretty. There is a light-colored variety of this equally beautiful, and, like the above, useful in making nosegays.

Ageratum Mexicanum is a very pleasing plant, and a profuse bloomer. Its blossoms are of a delicate light blue color.

All of the above mentioned are called half-hardy annuals, and require near about the same treatment, may be all sown the same day, and upon the same gentle hotbed, and all may be finally planted out on the same day, if time, &c., permit at the proper season. They are all showy flowers of long duration.

The *China* and *German Asters* are, generally, treated like the above, as half-hardy annuals; although with us, in the south of England, the natural soil, in an open south border, answers quite as well for their seed bed, and from which they may be transplanted even when in full flower.—*Cottage Gardener.*

Propagation.

There is nothing about gardening, from beginning to end, half so interesting to most people as striking cuttings and rearing seedlings from seeds of their own saving. The older a gardener gets, the more foolish he becomes in these two divisions of his craft.

All gardeners are well acquainted with the plan which seldom, if ever, fails in the most difficult of cases, when we apply it in hothouses, pits, frames, and hand-glasses; and I am firmly of opinion, that a slight alteration will answer extremely well for *Rose cuttings* out in the open air. That alteration I have tried myself this week, for the first time, and by so doing, I changed my garden, in effect, into a flower-pot; a proof positive, sure enough.

The plan is thus described by Mr. Forsyth, in the *Gardeners' Magazine* for 1835, page 562: "Take a wide-mouthed 48-sized pot, crock it in the usual manner; then take a wide-mouthed *small* 60-pot, and put a piece of clay in the bottom of it to stop the hole; then place it inside the other on the crocks, which must be of sufficient depth to bring the rims of both pots to one level; then fill in the space between the pots with sand, or propagating soil; and let the cuttings be inserted in the manner here shown, with their lower ends against the side of the inner pot. Plunge the pot in a cutting frame, or under a hand or bell-glass, in a shady place out-of-doors, according to the nature of the cuttings, and the season of the year; and let the inner pot be filled and kept full of water. "The advantages," he says, "are the regularity of the supply of moisture, without any chance of saturation; the power of examining the state of the cuttings at any time without injuring them, by lifting out the inner pot; the superior drainage, so essential in propagating, by having such a thin layer of soil; the roots being placed so near the sides of both pots; and the facility with which the plants, when rooted, can be parted for potting-off, by taking out the inner pot, and with a knife cutting out every plant with its ball."

Every one of those advantages have

been since proved to be quite true to the letter in a thousand instances. In short, a better system than this has never been invented; and he says himself, that Pink-pipings, and slips of Wallflowers, will grow this way easier than by any other mode; and I believe it, from what I have seen done with extremely difficult cuttings by the same process. Now, that I have to shift for myself, and pay the piper as well, I pay more for experiments than I ought to do, but I put in all my in-door cuttings on this plan, because there is no bother with them. I can leave them for days without any fear, and I seldom ever water them between the pots, except now and then in the height of summer.

This week I have tried a modification of the plan, out-of-doors, with *Rose* cuttings, that are to be rooted in the open air and without glasses, and if my application of the plan succeeds out-of-doors, as I have every reason to believe it will, I am satisfied it will simplify the striking of Rose-cuttings, and many other cuttings, out-of-doors, ten-fold. It is a practical illustration of necessity being the mother of invention. I am so convinced that all Roses ought to be grown on their own roots, except standards, that we should hear less and less every year about blights and green eyes, and less of all other complaints about Roses, if we had them on their own roots; that almost any kind of garden soil would grow Roses on their own roots; that the budding of dwarf Roses should be confined entirely to new kinds; and also, that the rearing of Roses, in the nursery trade, might be less costly than at present; although I can hardly expect the prejudice of the age will go along with me so far just yet.

All this, I say, I am so convinced of, that I have been considering, for a long while, about the best practices of propagation in the open air, so as to bring the question home to every one who hears of it, and cares anything about it; and the result is, that I have been forced to make out a new plan on purpose, out of the two best practices of modern times known to me. I have tried the experiment this week, as I have just said, and will report on it, if I am spared so long; and I want to hear the result of other trials of it, all over the country, next spring, if only with cuttings of one hybrid perpetual Rose. But even then, should the reports be two to one against it, I shall still hold the opinion, that we, ourselves, are to blame, rather than that the new plan is not according to the soundest practice, and founded on a principle which we cannot gainsay.

The first part of the plan I borrowed from Mr. Forsyth, and made it still more simple and less troublesome; and the second part—that about the cuttings—I learned from the late Mr. Knight, in his own garden, at Downton Castle, in 1830. Long before then, he published this system of making cuttings, in the "Transactions of the Horticultural Society," but, singularly enough, gardeners either forgot it altogether, or never heard about it; and I never saw it mentioned in any of our popular works; therefore, let no one suppose, that in looking-out earnestly for a sure and simple mode of striking cuttings out-of-doors, I was so foolish as to attempt a new process, while all that I could desire was ready to my hand.

The mode of preparing cuttings, in a particular way, was tried by Mr. Knight, so far back as the autumn of 1812; this experiment succeeded perfectly, and is recorded in the "Transactions of the Horticultural Society," vol. ii., page 117. Instead of cutting across under a joint, as we all recommend a cutting to be prepared for general purposes, when the bottom is to be placed *on* the soil or sand, he cut the bottom of his cuttings *on the slant*, so as to look more like a heel cuttings; the slant part he placed in contact with the pot, and the parts fitted as well as if the cutting had grown out from the pot itself.

Now, we know that when the ends of some woody cuttings touch the drainage, and rest upon it, they strike much faster than when they rest in the soil. We know, also, by Mr. Forsyth's plan, that when the ends of the cuttings rest against the side of the inner pot they root much sooner than if they were merely inserted half way between the pots; and, moreover, a heeled cutting, which is the same thing as a "slip," it being slipped from the branch, will get a better hold on the side of the pot than one cut right across, and will root sooner, on account of this very hold, so to speak, than the other. Then, there is no denying the fact, that being in close contact with the side of the pot hastens the rooting of a cutting; when the pot is constantly kept moist, as in Mr. Forsyth's plan, the rooting is sooner, and the cutting is a great deal more safe from harm. Last of all, when the end of the cutting is sloped, as by Mr. Knight, the whole is in that condition which they call *ne plus ultra*.

Those, therefore, are the foundations on which I propose to establish a *ne plus ultra* system of growing Rose-cuttings in the autumn out in the open air, and without the help of anything besides, and as many other cuttings as one chooses to try that way. But, first of all, let us not waste cuttings in learning how to make them so

as to fit to the side of a pot; rather take an empty pot, any size will do, and a handful of Laurel cuttings, and practice a-while, till one gets into the exact cut: put the knife across the cutting exactly under the last bud, and cut downwards slantwise; then fit the slant to the *outside* of the pot, just two inches below the rim, and if the bark fits the pot all round, as if with a graft, you have hit the nail upon the head at the very first start; but try two or three more to make sure work of it. The exact length of the sloping cut does not matter much, so that it is not too low, nor very short; at least, I think not; but I am as young in the fancy as any of you. My slope is about the same length as the heel to an ordinary Rose-cutting—a little more or less. My cuttings are hardly four inches long, and they are nearly three inches deep when planted, and I left two leaflets to each of them, the one to the top bud is out of the ground, and the next just within the surface; by the time I finished, you could not pull one of them out without a good pull; they stand close together, but that is not the better for them, only that I got more of them into a small space.

Here is the way I did it, and the space they occupy: I made a hole in a west border with a trowel, nearly ten inches deep and only two inches wide at the bottom; I then plunged a No. 24-pot into the hole, letting the rim of it be a little lower than the surface of the border—there is a good cavity below the pot, which is to make sure of drainage in the winter. I then opened a ring round the outside of the pot, three inches deep, and nearly filled it with soft yellow sand and light soil from the surface of the border—half-and-half; then, without a dibber, I began planting the Rose-cuttings in this trench, or ring, outside the pot, using only my hands, the left one to hold the slant of the cutting exactly against the outside of the pot, and the right-hand to draw and fix the sandy-compost right earnestly against both the cutting and the pot—and so on all the way round. There is clay in the bottom of the pot, and I shall keep it full of water till the end of October, or later, if the weather is dry. After that, the damp of the season will keep it in the right state for suckling the cuttings; but I shall keep an eye to it, and learn as I go. Now, my garden represents the outside pot in Mr. Forsyth's plan; I only took his inside pot, and I might put lots of drainage under it, as he did, but I wanted the hole for the outer pot; and how was that to be got, without cutting through right on to New Zealand! and that would be the hardest cutting to strike of all the cuttings we ever heard of.

Last spring, when I was planting out something, I found a bundle of Rose-cuttings I put in by the heels last autumn and forgot them, the most of them were callused at the bottom; but forgetting all about them, I thought the best thing would be to throw them away; then it occurred to me to try an experiment with them, and that experiment was the outset of the *ne plus ultra* system. The experiment was this:—there was a soft "place brick" in the garden wall behind me, the only brick of the kind I could see, and the frost took to it, as it was "between wind and water" as we say, or half in and half above the level of the border. I placed two of the cuttings against this brick, and another two against a dry "stock brick" next to it; but the matter which formed at the bottom, and from which the roots would come, would not admit the cuttings being put quite close to either brick which I wanted to do, to see the effect of what Mr. Fish says about the sides of a pot hindering the accumulation of matter at the bottom of cuttings, and so cause them to root faster,—a most valuable suggestion. The two against the dry brick perished from too much sun-heat in March; but one of the two against the soft brick rooted, and is now nearly a yard high, and proves to be some hybrid perpetual. I am now sanguine about the effect of the damp pot on my last cuttings; but I have no doubt about their rooting; and I shall report progress whether they root or not.—*Coll. Gard.*

Chrysanthemums not Flowering, and their Culture.

"I ENDEAVORED to follow out the instructions so copiously given, as to the management of these great favorites, at this season of the year; and by proper stopping, &c., I have got beautiful compact bushes, but very few flowers. What is the reason? I struck cuttings of the Pompones in April, potted off, and then put them in other pots—but the flowers are not so fine as I wish, and the plants, though every care has been taken of them, are perfect Lilliputs in size, compared to those we read about as exhibited at the various societies. Can not you give us a wrinkle!"

"The Chrysanthemum is a thorough cottage flower. In most parts of England, many kinds are never more at home than adorning the walls of a cottage, with the roof, thatch, or otherwise, projecting far enough to throw the heavy rains past them. Inside windows it is equally at home, and, I believe, would be more prevalent there, were it not that you great gardeners, in all

your notices and treatises, treat first of the propagation, and that is always done in a gentle hot-bed, or under a hand-glass in the open air, while myriads who love this flower, and would be proud to grow it, have nothing of such conveniences; and for them you should mention the most homely and easy modes of treatment."

These are a sample of the inquiries and the complaints that reach me; and I will do my best to meet them in a few words. If our friends would look over the "indices" of previous volumes, they would find that considerable space has been devoted to the lovers of flowers, who have little of a garden besides the walls of their domicil, and the windows and balconies it may contain; though, in their case, the advantage of some receptacle, however rough, for protecting, advancing, or retarding plants, has been referred to. I have long ceased to feel surprise that the love of flowers is anything but proportioned to the means enjoyed for the gratification of such a taste for the beautiful. Many a time have visits been paid to me, and inquiries made in passing, as to the growing and keeping of some plant, that in a gardener's eye was of little importance, though the plant was more than interesting to its possessor; either from a warm appreciation of its peculiar beauties, so fully investigated, or from some charms, hidden to all but the possessor, entwined and associated with it; and if, more than at any other time, I have felt humbled in my deficiences as respects professional lore, it was when finding that some of the questions, seemingly very simple, were beyond my powers of answering.

At one time, to a great extent, and until the present year, I have always, to a limited extent, grown these beautiful flowers, and have tried, with satisfactory results, many modes of doing so. A short description of some of these may meet those and other cases; merely premising, in answer to No. 1, that he had kept stopping his shoots too late; to No. 2, that, in all likelihood, he had exposed his pots too much to the sun, and to drenchings and to drouths alternately: and to No. 3, that suckers, and dividing an old stool, or, if small, thinning it out, and growing it on, will yield results often superior to fresh propagating from cuttings every year.

It is too late to give any instructions as to managing the flowers for this season. These will, generally, be on the wane before this is read; but a few words may be of use, as to the treatment of old plants in pots. Until it has been satisfactorily proved to the contrary, we would treat the Pompones as a little more tender than the older and the larger kinds. Both of them will bear a considerable amount of frost uninjured, if they have not been made tender, by the young suckers being allowed to grow to any size in-doors; more especially if the pots are plunged, and the soil kept rather dry. Whatever the future mode of growing resolved upon, as soon as the old stems are cut down, the less the young shoots grow, until spring, the better. A cold pit, with plenty of air, unless in severe weather, and the glass protected only then, would be a first rate place for them; and, unless in extreme cases, they will there absorb sufficient moisture without any waterings. Failing that, any dry, sheltered place, where a little protection may be given them from severe cold, or very wet weather, will be the next best position. As a protection alike against frosts, slugs, and worms, the plants should, if convenient, be plunged in, and the surface of the soil be slightly covered with coal ashes. Do everything to keep the plants from danger, and yet to discourage growth during winter; and by March and April you will have firm, stubby shoots, two or three inches in length, instead of longer, soft, and spongy ones; and this stubby commencement will tell greatly on the health and the strength of the plant, whatever the mode of growth adopted. The north side of a wall, or hedge, is perhaps, the best position, next to a cold pit, and of these two, I would prefer the hedge; because, when necessary to give a little protection on the north side, there would be a circulation of air through the hedge on the south side. These are trivial matters, but attention to minutiæ lays the ground-work of ultimate success.

Gardeners, in general, prefer raising their plants from cuttings every year, and when properly done, they are more free from suckers than those grown from dividing the plants, and, in general, are more fully under control, though requiring more care. Although properly drained and prepared pots for cuttings are always an advantage, yet no great nicety is requisite for striking Chrysanthemums. I have frequently put a piece of tile over the bottom of the pot, put a good handful of half-decayed leaves over it, filled the pot with light sandy soil, then filled it with cuttings, inserted it in a hot-bed, 75° at bottom, and 55° at top, and before a fortnight the pot was crammed with roots. I will now glance at some of the modes adopted.

1. Being anxious to obtain some large symmetrical plants, firm cuttings were taken off in the first week of March, about three inches in length: each one was cut across at a joint at its base, the leaf there, and each one, for half the length of the

cutting, was removed, and the small incipient bud, hardly to be seen in its axil, picked out with the point of a pen-knife, that shoots and suckers should not so easily come from underneath. As soon as inserted, they were placed in a hot-bed; when struck, they were potted in sixty's. As soon as the roots got near the sides of the pot, the plants had the one shoot stopped; when full of roots were again potted, using rich, light soil; more air was given to harden them off by degrees. Meanwhile, a quantity of half-decayed leaves, stored in a good position, a little dung, and the mowings from the lawn, mixed with this, but the leaves kept at the top, gave the mass, in the middle of May, a nice bottom-heat. In this the pots were plunged, protected, and screened, for a short time, with spruce branches, and by the end of the month, as there were generally about three strongish shoots, and a couple of weaker ones to each plant, the stronger ones were stopped back, to furnish two or three each, and if deemed necessary, were tied down, to make them break freely. This generally gave a plant with eight, nine, or more shoots, the centre ones being rather the strongest, but not robbing the others. When growing freely, they were repotted and replunged, and the chief things in their management were, to stand thin enough to have air all round and amongst them; never to know the want of water; never to lose a ray of sunshine; and after the stems were freely growing, to pick out incipient shoots from the axils of the leaves, until from six to nine inches of the point. These plants showed bloom early, and fine flowers they were. Many were in eight, and some in twelve inch pots. Though kept plunged, there was no extra bottom-heat after the beginning of July; there had been no stopping of the shoots after the beginning of June; the plants were twisted round half-ways at a time, every few days, for the double purpose of preventing any rooting in the leaves to speak of, and to give each part of the plant an equal amount of sunlight; and after the last potting, and the roots were catching the sides of the pot, not only were weak manure-waterings frequently given, but also frequent mulchings of sheep and cow-dung, a year old, were laid on the surface of the pots.

2. A second batch of cuttings were inserted about the middle of April, and treated in every respect the same, and did well, though the foliage is not quite so fine, and the plants were not so large. In order to make these latter plants as large as the first-struck, a few had their shoots stopped at the end of June, and the first week in July, but the flowers of the former were not equal to those stopped earlier; and in the case of the latter, many did not form buds at all, while others that did so never opened, or only in a deformed state.

3. On other occasions, I have inserted cuttings in April, potted off, and kept in a close, cold pit, or in a cool hot-bed, stopped and, perhaps, bent the shoots to make them break freely, and by the middle of June, plunged them in six-inch pots in an open quarter of the garden, or in front of a fence, giving them the necessary tying, waterings and prunings, and mulchings with rotten dung, &c. These mulchings encouraged surface rootings, and by the middle of September, or the beginning of October, when these pots were raised, it was found that scarcely any roots had gone out at the bottom of the pot, but some beauties had run freely over over the surface, and these went easily into the larger pot, to which the plant was transferred, and the soil being rich and open, a good proportion being roughish leaf-mould, the plants hardly felt the change, when kept in a shady place for a few days, while the fresh potting gave fullness to the buds and size to the flower.

4. Striking the cuttings under a hand-light in the open ground, in the middle of April. I used to cover the place intended with an inch or so of clear sand; the soil below being sandy-loam and leaf-mould. The cuttings were generally stopped some time before they were taken off. This caused them to have buds swelling in the axils of the leaves, ready to break into shoots. For this mode, I liked to have the base of the cutting as near to where the surface soil came to as possible, or even a little beneath it, that it might be firm; and, as in the other case, rubbing off the buds, where shoots were not wanted. The handlight merely required shading in very hot days. The cuttings having been stopped at the point before they were made less time was lost in forming shoots. Some of these I have potted, and then plunged; and others I have planted out in a rich, prepared border, some two-and-one-half feet apart, to be properly trained and fitted in the autumn. The best mode, however, with these, is to have narrow trenches made, as narrow as would do for a row of Celery, but not above half the depth; the sides beat firm; and part of the soil nicely incorporated with leaf-mould and fresh sandy-loam, to fill the trench; and the plants brought from the hand-light, and inserted, about two feet apart, will, if duly watered, grow very fast, and after being thinned, disbudded, and stopped for the last time, by the middle of June, will make nice plants, that will rise with nice balls full of fibres, when you wish to pot them, which

should be done by the time the flower buds are perceptible. A north aspect, and syringing several times a-day, will keep them from flagging, until they are growing freely; and then a cloudy day should be chosen to put them in a permanent position.

I find that much mistake exists as to stopping a plant when more shoots are wanted. Many suppose, that it merely means nipping out the point of the shoot, as you would do with a small cutting; but this is not the thing meant, when we speak of the final stopping of these plants. For instance, here is a young Chrysanthemum plant that has been early stopped; it has four shoots; two of them are about three or four inches in length, and weak in proportion; one 8 inches; another 14, and strong in proportion. Now, by merely stopping these two shoots, by nipping the points out, you would throw more strength into the two weak ones; but these stopped shoots will be of no use until they form others, as the plants bloom at the points of the unmutilated shoots. For a symmetrical plant, it is desirable that the shoots should start from points not far apart; but by merely nipping out the point of the stronger shoot, you have no security where the two or three you expect from it will come from; and to equalize such a plant as this, you world require two fresh shoots from the one stem, and three from the other. These strong shoots must, therefore, be cut back nearly to the point, from which secondary shoots are expected; or, what I prefer, in such a case, as giving less of a check to the growing principle of the plant, nip off an inch or so from the point of the shoots, and then tie them down, so as to give a slight strain over the place where you wish the shoots to come from. It will often be necessary to do this with all the shoots when nearly equal in size, because any inequality in their strength may be easily regulated by the number of shoots you finally leave to each. Provided this last stopping is effected early in June, and the plants are well attended to, there will be no danger of having shoots destitute of bloom.

One advantage of giving plants all this labor in growing them from cuttings every year, is, that they present a more artistic appearance, as they may be trained as regularly from a short, stout, upright stem, as is done in the case of a Gooseberry or a Current bush. I have frequently struck cuttings in May and the beginning of June —and from plunging, or planting-out, as soon as struck, I have obtained very fair flowering plants: but if by stopping, I had tried to give such plants an equal number of shoots with those struck six weeks or two months before, I should expect the beauty to consist more in symmetry of form than in plenty of flowers. Every shoot on a plant that is well grown has had plenty of sun, air, and water, and from four to five months of our best weather to mature itself, will be terminated with a fine bunch of flowers, be there one shoot to a plant, or a dozen, or twenty. I may also add, that in growing in pots, though far from impossible, yet it is very difficult to keep the stems clothed with fine, large leaves to their very bottom, unless the pots are plunged, as well as properly attended to in waterings.

5. *Growing by Suckers and Division, &c.* —These are modes the humblest cottager can try, and my experience leads me to the conclusion that the results will be little inferior to the modes requiring hand-lights and hot-beds. In most kinds, soon after blooming, if not before, suckers will commence rising from the bottom. If these are very thick, it would be advisable to thin them considerably. In breaking the otd ball in the spring, you will find that each of these snckers are rooted to your hand, though the roots are easily injured by exposure to the air. If you manage to get the most of the incipient buds picked out, these will trouble you with few more ground shoots than cuttings. These rooted suckers may either be potted or planted at once, in a preparatory bed, where you can shelter them a little from sunshine and cold, by means of a mat, a cloth, or a branch; and when well rooted, you may either pot, or plant out, as advised for cuttings. Small plants of this autumn, instead of being divided, may have the earth shaken away, the redundant or smaller shoots thinned out, and the plant at once repotted or replanted; all the care required being to srain the shoots left, and if they start of an equal strength, they will, generally, remain so. At one time, for a number of years, I had a great deal to do with the Chrysanthemum as an out-door flower, in borders and against fences, on all aspects. I found that old plants, properly thinned out in the spring, part of the surface-soil removed, fresh loam added, and a good mulching of dung over all, beat, for years, younger plants, treated otherwise alike, that had been raised by cuttings. I also found that divisions or lumps of such old plants, planted without allowing the roots, and especially the surface ones, to get dry, and allowing only the requisite number of shoots to remain, beat, at flowering time, those plants raised either by cuttings, or single-rooted suckers. I also found, that though less artistic and graceful in outline at the base, a small plant thus treated, and grown in a pot, right on,

or taken up and potted, after being previously planted in prepared ground on purpose, gave more flowers, with less trouble, than a plant struck as a cutting, and several times stopped, to give it something of the bush shape. My advice to cottage gardeners, who have no glass, and yet wish to have these Chrysanthemums on their walls, and in their windows, is to stop the shoots, little or none, and to content themselves with suckers, and if, in other respects, they follow the directions given as to the summer treatment, they will have no reason to be disappointed. Towards the end of April will be early enough to repot or replant; and in late springs, the middle of May would do.

6. The Pompones I have had less experience with, but they seem quite as easily managed as the older and larger kinds, and from their dwarf size, will be very valuable for windows, as most of them that I have seen may be bloomed at from twelve to eighteen inches in height. Very nice little plants may easily be procured from cuttings in spring; but when dense little bushes from a single cutting are wished for, that cutting must get bottom-heat early in April —be kept in a hot-bed, the heat decreasing as the days lengthen, until towards the end of May; it will stand the open air, either plunged or planted out, having previously received several stoppings, to secure the necessary number of equal sized shoots—these being trained out regularly, something in the shape of a half-circle. Our window-gardeners will find they can have very ornamental bushes without all this trouble, by merely shaking the earth from the small plants they now have, next April —repotting or replanting them again—shading until fresh growth is freely taking place, and then thinning out the shoots, or shortening some to produce more, according to the circumstances of the case; keeping in mind, that a similar sized pot will carry double the number of shoots of these, that would be desirable in the older, tall growing kinds.

7. These Lilliput Pompones do away with the objection that many had to the Chrysanthemums, as they can be made very symmetrical as a bush, which it was next to impossible to accomplish with the other. I find, however, that dwarf as they are, some would wish to have them dwarfer—the flowers merely a few inches above the surface, and therefore, I may add, I have frequently found two modes very useful for securing these little plants. The first, is to take off cuttings of the joints of shoots, just as the buds are forming, at the end of August, and insert three of these in a small sixty-sized pot, placing the cuttings at equal distances, close to the sides, and plunge them, if in a mild hot-bed all the better, though beneath a close hand-light will do, syringing and shading to prevent the cuttings flagging. Ere long, roots will be formed, and when the pot is getting full, transfer the cuttings, without disturbing them, to a forty-eight sized pot, and though giving air, keep them closish for a few days; as the pots are getting filled with roots, apply manure waterings, and the bloom will be of a fair size on very tiny plants.

The other mode has often been referred to. About the same time, lay the points of shoots growing out of doors into small pots, plunged in the ground, and take them up when rooted. In layering, you can hardly make a tongue, as you would do with a Carnation, the stems are so brittle. I have done it successfully by two ways—first, by twisting the part to go in the earth, so as to facilitate the protrusion of roots; and, secondly, by splitting the stem, by inserting a sharp-pointed knife through the middle, and carrying it along for an inch or two longitudinally, and placing a chip of wood or so to keep the incision open. This presents a large space of liber and alburnum matter for the protrusion of roots, and there being no cut *across* the shoot, there is little or less likelihood of its snapping. These modes may often be adopted in layering other things brittle and apt to snap. Lists of the very best sorts have been lately given. R. Fish.

Giving Air.

"Winter is now coming on us, and I feel perplexed about your rules of much and little air-giving, to suit different plants. Will not the house soon become of the same temperature all over, even when most air is given at one place; then why the necessity of arranging the plants in groups? I take nature for my guide, and like to see my plants regularly mixed." There is no necessity for disputing your taste. To a certain extent, a man may do "what he likes with his own," provided he touches on no privilege or right of his neighbors; and this you are not likely to do by arranging your plants just as best pleases you. The basis of your theory—a uniformity of temperature in the house—is quite a different matter. Have you experienced the same sensation, as respects heat, when seated near an open window in a cold day, as when you removed to the other side of the room, where a fire was either burning, or there was still heat left in the walls from the fire of the previous evening? Besides, a cold air is quite a different thing when

perfectly still and when in rapid motion. In the one case, we can bear it for some time, almost insensible to its influence; in the other, we get rapidly chilled at every pore. Just so with plants. The greater the disparity between the inside and outside temperature, the greater will be the motion produced inside by a free admission of air. Wherever the opening is made, the current will there be the strongest. At the end of the house, where little or no air is given, the motion will be less, and the temperature will be higher, though, of course, there will be a constant tendency to an equilibrium, unless there is a counteracting agency at work. When the sluice of a mill-dam is opened, the rapid current takes place at the sluice; it is some time before the motion is at all perceivable at the farther extremity of the reservoir. The cases are by no means analagous, yet the one may serve to illustrate the other. Hence we consider the following positions as being next to self-evident.

1. Plants in greenhouses should, if possible, be grouped into hard-wooded and soft-wooded; plants in bloom and not in bloom; plants growing and in a state of rest; just because hard-wooded plants, and plants in a state of comparative repose, will stand more cold air in motion than soft-wooded plants, or plants growing rapidly, or in bloom. A dampish, rather still atmosphere, that would not disagree with a Cineraria, or a Calceolaria, would ruin a favorite Heath, that on its native hill-side, at the Cape of Good Hope, enjoyed the bright, warm, dry days of summer, and the chilling nights of winter. The reasons why the Heath will not stand with us, a temperature equally low to what it endures harmlessly at home, are chiefly two-fold; our atmosphere is more charged with vapor, and we have less powerful and continued sunshine to elaborate the juices and consolidate the tissues.

2. Air may be given freely to greenhouses in winter (keeping the above precaution in mind) when the air is still, or there is only a slight breeze, and there is little difference between the external atmosphere, as respects temperature, and what you wish the internal temperature to be. Even in the most favorable circumstances, it will, however, be always advisable to shut up close at night, from the end of October until the middle of April. In cold, frosty, or foggy weather, the houses should be shut up, at the latest, by two o'clock. If the sun should shine rather powerfully in the afternoon, the heat stored up will save the fuel-heap, and prevent the plants being so much deprived of their moisture.

3. The greater the disparity between the wished-for internal and the external temperature, the less should be the quantity of air given. This will at once appear, from two considerations. First, the giving of much air in very cold weather pre-supposes a free recourse to a heating medium; and the employment of that again, unless means are taken to counteract it, by evaporating-pans, &c., which, again, will just require more heat to raise the water into vapor; will so dry the atmosphere, that it will extract moisture wherever it can find it, from stems and leaves as well as soil. Then, secondly, a keen, frosty air, is next to kiln-dried air. It cracks the stems of shrubs; it splits the bark of twigs; it makes openings in the back of our houses; it prints its fissures on the rosy lips of beauty; not solely and alone by the congealing and expansion of the juices, for this will not take place to any extent, until these descend beneath the freezing point, but, also, by stealing moisture from whence ever it can, to get back again its general amount of vapor. Imagine not so much the contest between dried, heated air, and dried air 15° or 20° or more below freezing-point, or even the seeming quickness with which they mix and mingle, as they pass and repass each other; but rather figure to yourself the decision to which they have generally mutually come, to extract, bleed, and sweat out, as much of the life-blood of your plants as will bring themselves nearer the verge of moisture-saturation point. Hence, I have several times seen plants in a greenhouse, in a cold winter, presenting such a woe-begone appearance, as if they had been exposed to more than the parched heat of a desert sirocco; and yet the owner could tell you of the hours of sleep he gave up in attending to fires, and how he kept them burning all day, that he might give plenty of air, because he had been instructed, that without that abundance of change of air at all times, his plants could not thrive. It is very true that these evils might have been lessened, by damping the floor of the house, by using evaporating-pans, and by frequent syringings of the stems and leaves; but though all these operations are at times highly serviceable, and I have frequently recommended them, the extreme use of them would give you an amount of moisture in the house, and when the weather changed, you would very likely, be under the necessity of lighting fires again, to dissipate that extra amount of moisture. By the mode I recommend, much labor will be saved, and much fuel remain unconsumed. Keeping these statements in view, I will endeavor to make this third proposition as simple as possible to

young beginners, by a few suppositions and examples.

1. It is desirable to give your greenhouse, on an average, a temperature of 45° at night, with a rise of from 10° to 20° at mid-day from bright sunshine. If you shut the house up early in the afternoon, because the sky was clear, and you expected a little frost before morning, the plants would receive no harm, though for an hour or two the house was higher than usual, because sun-heat, being accompanied by light, would not draw and debilitate like artificial heat without light; and the consequence would be, your house would want little or no artificial heat to keep it up until the morning; and the character of the day would regulate the quantity of air to be given, making shrewd guesses, after mid-day, whether the evening was to be mild or keen.

2. But in the conditions implied in such a house, a keen frost comes, some 5°, 10°, 15°, or more degrees below the freezing point of water; you know that the cold must be kept out, but you also know that the greater the cold the greater the consumption of fuel; and, consequently, the greater tendency to kiln-dry the air in which your plants respire and perspire; and you use evaporating pans and syringings to rectify this evil; having nothing to grumble at but the consuming furnace, that keeps ever crying the live long night, Give! give! as the frost increases in intensity. You will now, we trust, also perceive, that though 45°, or even 48°, or even 50° at night be a good average, in fine, mild weather, that your plants are some of the most yielding, obliging things alive; and that for short periods they will not suffer at 40°, or even at 38°, unless, perhaps, some few tender things brought from the forcing-house; and, coupling this with the double fact, that the more the mercury sinks, the greater will be the quantity of fuel requisite to keep up a highish temperature, and the more will the air be dried in consequence; you come to the conclusion to lessen the double evil, by allowing the house to get 5° or so colder; and, not content with that, but knowing that radiation of heat from a body would be, to a certain extent, intercepted by an opaque substance coming between a body cooling, and the medium into which it radiates its heat, you cover part, at least, of your glass with some protecting substance, be it cloth, mat, felt, *frigidomo*, hay, or straw; and you thus save fuel, and promote the future health of your plants, by saving them from too much of a dry heat. In fact, instead of making the plants take a forced march, in unfavorable circumstances, you present them with a period, during which they can recruit their powers by rest and inaction; and if not carried to an extreme, they will afterwards reward you with their sturdy appearance.

But you say this is all very well as a pleading in a case—protection and lowish temperature, in cold weather, *versus* the furnace and a hot dry atmosphere;—but what has that to do with *air-giving?* Well, I may be wrong; but in the case under consideration, I could hardly dissociate the one from the other, they seem so much like twin sisters; or pretty well as much united as husband and wife. But now, since we have come to the length of allowing the thermometer to fall a few degrees, in preference to dry roasting the plants, let us walk into the house at six or seven in the morning—it stands at 40°; all right; but it is biting cold; the outside thermometer is at 18°, and we may expect it to fall a degree or two more before sunrise, and a brisk breeze is bringing the blood to the skin, and a black frost and a hazy mist tells us there will be little or no sunshine to-day. The first thing to do is to stir up and light a fire, just to prevent the house getting lower; and if the black frost continues, and there is no sun, a mild fire will have to be kept up all day, so as to raise the house from 5° to 8° before the evening, allowing it to fall again during the night. With such a wind, sweeping off the heat in a five-fold ratio, the more glass that can be covered, even during the day, the better; provided the days of such a kind are not numerous at one time; and every hole and cranny should be stopped; for with all our care, quite enough of cold will get in without any air-giving.

But in another case, with an equally severe night, the day and the morning are different; for the sun shines brightly, even though it freezes hard in the shade. With the first buddings of sunshine, the fire-heat should decline. It will then require more sun-heat to raise the house, 5° or 10° higher than usual; and that, in general cases, in such circumstances, I would do before opening any part to the external air. And how to do it then? Throw open your seen clever youths do, and who ought to front sashes freely? as we have not seldom have carried a good mark of a cudgel, as their star and ribbon of honor from the court of promotion and progress. No!. but when the house rises to 60°, and onwards, the foliage receiving a slight dewing from the syringe, and this rising will take place sooner or later, or not at all, to the above hight, in proportion to the size of the house, as respects its cubic feet of air, and the inclination of the glass, meeting the

sun's rays at a perpendicular, or a more obtuse line of incidence; when this rising does take place, we would merely give a moderate portion, or rather, a very small portion, of air at the top sashes, or the highest point in the roof, and that for two reasons· first, the air will be more heated and rarified there, on the outside, on account of the sun striking against the glass; and, secondly, the air thus partly warmed, on the opening of the sash, passes at once through the warmest and moistest air of the house, and thus becomes heated and moistened before it comes in contact with the plants. If the day was windy as well as sunny, even more care would be necessary to give little; and in extreme cases, and with young beginners, stretching fine netting over the openings would be an advantage. In either case, during the winter months, with every prospect of again having a frosty night, shut up close between one and two o'clock in the afternoon.

The case of fine, mild weather having been taken into consideration, there is only one further case to which I will refer:—Cold, damp, still, foggy weather, that searches its way into every nook and crannie. This damp fog never yet did any good to greenhouse plants, and to such tribes as the Heath nothing can be worse; for, if long continued, it is a sure winding-sheet for them. This dull, thick fog is generally attended with cold weather, the temperature not often being many degrees above freezing. The difference in heat alone will often be sufficient to keep it outside of our greenhouses, and as to opening a sash to bid it welcome, that must not for a moment be thought of. Sometimes it will enter—especially if the weather is rather warm—and when it does, it must be let out again by lighting a fire, the heat of which will change the visible into invisible vapor, and cause a circulation, or rather moving of the air of the house. In extreme cases, when the weather is very still, a little air may be required to aid the fire-heat in promoting motion, &c.; but, as soon as the enclosed atmosphere becomes clear again, the air openings may again be shut.

Taking these few cases as prominent points of observation, the matter of air-giving in winter will be relieved of many of its perplexities. The giving air to a greenhouse in summer is a very simple affair. R. Fish.

In Cottage Gardener.

Mourning of the Plants.

Why quivers the aspen when not a breath disturbs the summer heat? whilst other trees are enjoying repose, and affording the blessings of shade, it alone knows no rest?

Pride was its bane!

At that dread hour when our Redeemer suffered, the sun hid its light, and all nature quailed.

The wild beasts of the forest cowered in their dens; not a bird twittered; not an insect buzzed or chirped; the voice of the breeze was hushed in the sultry air, and men awaited in alarm the great event.

The trees, shrubs and flowers felt the awfulness of that hour, and sympathized with each other upon it in their own mysterious language.

The lofty cedar of Lebanon (*Pinus cedrus*) rustled forth a melancholy sound, and clothed its branches in deeper green, in sign of mourning.

"Alas! all is now over!" gently murmured the *Selix Babylonica*, and swept the Euphrates with its mourning branches.

The vine dresser in his vineyard saw that the vine wept; hence, when its fruit was gathered, he called the produce *Lachrama Christi.*

A balmy fragrance arose on the Golgotha; the *Hesperis Tristis* (sweet-smelling night-stock) offered it up, to refresh the suffering Son of man.

The *Iris Susiana* said to the cypress, "from this day will I attire myself in a garb of mourning." "And I," replied the cypress, "will henceforth take up my abode among the tombs, in memory of this hour."

A form flitted through the gloom—it was *Astaroth*, the angel of death, on his way to the cross; and when a voice was heard to exclaim; "My God, my God, why hast Thou forsaken me?" every branch, leaf and flower trembled.

The *Populus* alone, a tall, proud tree, stood unmoved on the Golgotha.

"What are thy sufferings to us?" it cried, "we plants need no atonement; we are not fallen!"

But the angel of death who heard this boast, breathed upon the haughty tree, and the unfortunate *Populus* was struck as with a palsy.

Its leaves drooped; never from that moment have its branches found rest; and it is called the *Populus Tremulosa*, or the aspen, to this day.

Editor's Bureau.

Valedictory.—Close of the Volume.

The present may be a suitable occasion for me to address a few *words at parting*, to my kind readers—more especially will I crave the attention of those who have followed, from my beginnings, and watched the monthly appearance of the serial missives which I have had so much pleasure in sending to them. These have been the results of thought exercised upon laborious observation and practice, at home and elsewhere, and gleanings from many sources, of such matter as it was supposed would be valuable and interesting to some of the varied tastes that had to be consulted, among the diverse readers for whom it is an editor's duty to cater.

This is the close of the volume, always an interesting period to those who are connected by the relations that subsist between the editor of a periodical and his readers; but now, particularly so to the former, on account of the incertitude which unhappily exists as to his future. He does not know whether or not the pleasant intercourse which has heretofore existed, is to be continued—and therefore he desires to leave the field, if leave he must, with the most delightful recollections of the labors of love in which it has been a great pleasure to him to have been engaged for some years past.

Every effort has been made to solicit the support necessary to continue the publication, in such a manner as to be self-sustaining, and, thus far, without sufficient encouragement, therefore, it is apprehended that it must be suspended, for the present at least, for you cannot desire the expenditure any longer of limited means, upon which other interests have strong claims, and in default of extrinsic support, which perhaps you may think would be cheerfully rendered, but which has not made its appearance, it seems the wiser course to withdraw from the tripod, and retire to the humbler and more peaceful paths of private life—to the farm, the garden, the orchard and the vineyards, for which the heart has yearned these long years, I therefore cheerfully retire, carrying the most fervent devotion to the beautiful studies of Horticulture and Pomology.

The field of labor is not deserted however, the record of observations will still be made carefully and diligently, and from time to time they shall appear, if the public so desire it. The long devotion to rural affairs, and the deep love for them, with even moderate ability, make one feel that it is his *mission* to eliminate, digest, and prepare didactic teachings for those who desire information upon such matters. The growing interest in Horticulture, which happily prevails among our people, as a blessed evidence of the prominence accorded to the arts of peace, cannot fail to furnish readers, and therefore, if you will excuse the egotism which possesses your friend, will you allow me to say that I shall prepare some books for your perusal. The first of these will be a treatise upon *the Grape, its Culture* and *Wine making*, which has been sometime in contemplation, and is now in hand, and may shortly be expected to make its apperance, if health and strength be spared. The propriety of commencing with this volume will be apparent to those who are aware of the vastly increasing attention which is now bestowed upon this branch of culture, that is most successfully conducted in this neighborhood, is rapidly extending in various portions of the country, and which is perfectly familiar to the writer, in consequence of long study and observation.

To each, I bid a hearty farewell on leaving the chair editorial, and can assure you, that with all its annoyances and vexations, the discharge of the functions belonging to it have been a source of great pleasure to your friend and well-wisher,

THE EDITOR.

Hedges.

It is not proposed here, and at this time, to write an essay upon this subject, which indeed is acquiring great importance in all countries where live fences are required; but having recently had an opportunity of discoursing upon this matter, before the United States Agricultural Society at Washington, and the venerable Society for the Promotion of Agriculture in Philadelphia, I simply desire to put upon record, the concurrent testimony of D. Landreth Esq., President of the last-named Society; and also to notice the circulars of some enterprising nurserymen or hedgers, who appear to be well

qualified to complete the contracts they undertake.

Mr. Landreth, in a communication to the Germantown Telegraph, concurs entirely with the remarks made by me in Philadelphia, especially with regard to severe pruning or cutting back. His experience, founded on the observation of many years, induces him to say, "I believe it (the Maclura) to be in a remarkable degree adapted to hedging purposes; perhaps, more so than any other plant. The Maclura has every good quality to recommend it; hardiness, vigorous growth, endurance of the shears, without disease or morbid growth being induced. acrid juice, which protects it against the attacks of insects, pungent spines, and a disposition to branch, when cut-in; these and other qualities indicate it as a plant which, it might be said, nature had designed for protecting the labors of the husbandman." This testimony is the more valuable, as Mr. L. was one of the first, if not the very first, who applied the plant in this way, (perhaps in 1828,) and recommended its use for hedging. His father planted the first seed, the tree from which is still standing in Philadelphia, a noble specimen.

The Hedgers McGrew, Leas & Co., near Dayton, Ohio, have become familiar to intelligent readers of the agricultural press, and Mr. McGrew has prepared a valuable paper for the Patent Office Report, which will embrace, it is hoped, much valuable information upon this subject, as the writer understands the matter, and has perfected the hedges on his own farm. This firm has established several branches in various parts of the country for the sale of plants, and for the production of hedges, upon terms that are favorable to the farmer. They have now located a large tract of land in Illinois, to insure sufficient space for their large operations.

K Graves & Co., Harveysburg, Ohio, also advertise to make and warrant a good stock-proof hedge, and they invite the attention of Farmers and Railroad Companies to their proposition. Messrs. Horr & Fahnestock, of Dubuque, Iowa, have also issued a circular, in which they express their confidence that they will be serving the community as well as themselves. Our old friends Overman, of Fulton, Ills., and no doubt many others, are equally patriotic, and may be as well qualified to treat the Osage Orange in such a way as to produce that great desideratum to the Farmer—a perfect fence.

J. A. W.

☞ Temperature of the summer months at Muscatine, Iowa, for 16 years, from the observations of T. S. Parvin, Smithsonian observer:

	JUNE.			JULY.			AUGUST.			
Years.	Mon. Mean.	Maximum.	Minimum.	Mon. Mean.	Maximum.	Minimum.	Mon. Mean.	Maximum.	Minimum.	Sum'r Mo's. Mean.
1838	Record incomplete.									
'39	70.60	89	48	75.70	95	58	73.10	92	49	73.13
'40	72.39	88	67	73.90	86	58	70.50	86	54	72.23
'41	71.10	96	49	70.40	96	56	65.60	96	48	89.00
'42	63.60	92	43	68.30	94	50	66.80	92	44	60.23
'43	67.70	90	40	70.40	95	55	70.60	94	49	60.56
'44	65.80	9	42	74.40	94	56	60.80	90	46	70.00
'45	64.20	78	54	76.00	98	50	70.80	93	48	70.33
'46	69.10	82	54	72.90	94	44	71.90	94	54	70.30
'47	62.40	86	40	69.50	92	42	65.20	36	42	65.70
'48	54.30	88	33	93.90	85	48	66.60	86	48	64.93
'49	67.60	86	44	66.40	89	42	65 20	86	36	66.40
'50	70.17	88	40	74.22	84	50	72.22	94	50	72.90
'51	64.64	85	44	71.62	92	44	69 09	85	52	68.11
'52	66.80	90	40	72.36	94	45	68 98	92	44	69.71
'53	71.22	91	40	68.85	89	46	71-08	92	41	70.37
'54	68.96	94	41	76.86	98	46	73.00	99	46	72.94
Mean	67·45	88	45	79.60	92	49	69.46	91	47	69.50

In June the thermometer rose above 90° five times, sixteen times in July, and thirteen times in August, or thirty-four times in ninety-two days of summer.

The *maximum* of the thermometer for June was, in 1831, when it rose to 96°· for July, this year and 1845, it was 98°; and for August the maximum was the present year, when for three days in the last week [and the Ist day of September,] it stood at 99°—in the shade, on the north side of my house (which is square with the world,) suspended five inches from the wall (brick), five feet above the ground, 72.21 feet above the Mississippi at Muscatine, and 586.24 feet above the Mississippi at its entrance into the Gulf of Mexico.

The mean temperature of July is the greatest of the three months. In '41 and 49, however, June was the hottest month, and August was, in '48 and '53.

An inspection of the first table will show that the mean temperature of *each* of the three months rose above the mean of these months for the sixteen years, during the years '39, '40, '50. and '54. And the last column proves that the summer of 1839 was hotter than the present .19 of a degree; while the old settlers will add their testimony to the figures, for they cannot have forgotten the era of staffs and umbrellas.

September (Tuesday) 5th. The Barometer, after having for weeks ranged between 29.60 and 29.70, fell in the afternoon to 29.50, and we had a light sprinkle in the night, which served materially to cool the atmosphere; on Friday it fell to .40, and we had 19 in. rain, and

the Thermometer, for weeks above 75°, and the weather, for weeks comparatively clear, became once more cloudy.

Mean temperature of the Summer Months for the three daily observations:

JUNE.			JULY.			AUGUST.		
7 A M	2 P M	9 P M	7 A M	2 P M	9 P M	7 A M	2 P M	9 P M
61.6	79.6	65.7	68.8	89.4	72.9	66.4	84.8	69.8

TRANSACTIONS.

The Cincinnati Horticultural Society.

This association has continued to manifest its usual zeal in the cause of improved Horticulture, and the meetings have been kept up with a good degree of interest. The affairs of the year have been wound up satisfactorily and with the opening of a new season, with a fine premium list, prepared to stimulate competition, the members have gone to work to emulate one another in the good work.

One of the features recently introduced in this Society, is the rendering of reports serially, upon all fruits presented upon the tables. These, though brief notes, in most cases, will enable the Fruit Committee to present the leading characters of the fruits to the members, and to assign each the place or grade which, in their opinion, it deserves. Thus, in the course of the year, the Society, and through them, the public, will be put in possession of much valuable information respecting the actual state of our knowledge of the fruits we are cultivating.

The following are samples of these reports, collected from the transactions at several recent meetings:

FRUIT REPORTS.

MR. PRESIDENT:

The Fruit Committee, to whom your suggestions for the advancement of the interest of the Society were referred at the last meeting, have considered the matter, and being equally desirous with yourself that our meetings should be made to advance the interests of pomology, we beg leave to propose the following

RULES FOR EXHIBITORS AND FRUIT COMMITTEE.

1. All exhibitors are requested to furnish the Committee with lists of their fruits, and give the desired information respecting them; neither they nor any other member of the Society shall touch the specimens until the Committee report upon them.

2. If any exhibitor desire to retain any specimens, he shall mark them accordingly, otherwise they shall be considered as belonging to the Committee, and will be subject to their disposal.

3. All fruits which may be exhibited upon our tables shall be subjected exclusively to the control of the Committee, until they be prepared to report upon them.

4. The Committee will proceed at once to arrange the fruits and collate the lists, correcting the names, when necessary, before handing them over to the Secretary. After examining the fruits, they shall, as early as possible, report to the Society any remarks that may have been suggested by their inspection of the specimens.

5. For the sake of eliciting any information which may be in the possession of the members at large, these reports may be considered by the Society and discussed by the members.

In presenting these suggestions, your Committee desire to advance the best interests of the Society, and it is confidently believed that the plan here proposed will prove satisfactory. Our previous experience induces the belief that these rules are especially necessary for the comfort of the Committee, and hence, also, for the advancement of pomology by the members, and we trust, that, if well executed during the current year, the Society will be in possession of a mass of valuable information respecting the fruits of our region, to which we may refer as to reliable data.

Newtown Pippin—First-rate; a good keeper, of high flavor, and excellent when ripe (in March,) not the most digestible before it is perfectly mature; good for the kitchen at any time during the winter; *White Pippin*--tree thrifty and productive; fruit delicate, but not high flavored; not known by any book name, but very generally grown in Southern Ohio and Indiana; season, January. *White Winter Pearmain*—a prolific and good keeping sort, not first-rate in quality, but a safe-keeping variety, and a juicy, good apple in January and February, often confounded with the *Michael Henry*, from which it is not easily distinguished by the taste; seeds pale brown, while those of the *Michael Henry* are nearly black; its shape is also more conical, hence its synonyme—Sheepnose. *Wine Sap*—second-rate; a good, sound keeper, and very early and prolific bearer. The fruit is valuable also for cider, excellent in the kitchen for cooking, though not very highly flavored, nor of a delicate texture; it is considered a fair table Apple. *Pennock* and *Vandervere Pippins*—Both third-rate, and have been condemned as table apples, although they have been very extensively propagated and planted, being very vigor-

ous, large trees, that yield abundant crops. These varieties are disposed to rot, and are fit only for cooking. *Gilpin*—This apple is also known as *Romanite;* it is only third-rate for the table, having an earthy taste. The trees are very early and prolific bearers; the fruit is remarkably regular and sound, and may be easily preserved until March or April. It has been found to produce a very rich cider. *Rawle's Janet*—This Apple is so well known as scarcely to need more than a passing notice. It may well be classed as first-rate. It is very prolific, and should be thinned and well-fed to produce choice specimens. Its late blooming has caused it to be called "*Never Fail,*" as it thus often escapes frosts that have destroyed the blossoms of other sorts, such as the *Yellow Bellefleur.*

PEARS.—The *Messire Jean* is a good winter pear, tree thrifty, fruit turbinate, keeps well, juicy, and, when well ripened, melting, very sweet, but not very high flavored—worthy of more general culture. *Easter Beurre*—A first-rate winter pear, and will keep a long while. The specimen before us is still green; it has been presented to us recently, in a high state of perfection.

W. S. Hatch reported that the White Pippin, American Golden Russet, and "Spice Pippin" (Ortley,) were introduced by Silas Wharton into this neighborhood forty years ago. All of these fruits have proved excellent in this region.

Another specimen of the *White Winter Pearmain* was presented by J. K. Green, from which the character already mentioned may be verified. Also, an Ohio Seedling, supposed to have originated with Mr. McCormick, Anderson Township, this county; size medium, round oblate, flat at both ends; skin green, smooth, brightly blushed on the sunny side, few or no spots or specks, basin rather shallow, eye open, segments rather short, cavity narrow, stem slender. Section of the fruit shows the axis to be oblique, flesh rather tough, white, core small, seeds small, pointed and bright brown. Said to be a good keeper till May, and then better than Gilpin.

The Ohio Grapes are withered, but very palatable.

Rome Beauty, or *Gillett's Seedling*—This is a beautiful Ohio apple, of a thrifty growth, and productive bearer, quite a favorite where known, on account of its brilliant color and handsome appearance. Flesh tender, pleasant, juicy, not very high flavored; a good keeper until January.

Campfield—A sound keeper; rather firm, sweet. This is one of the celebrated cider apples of New Jersey, and is highly valued on that account. Tree thrifty and productive.

Milam or *Blair*—Extensively known throughout the West; in many places it has been propagated by root-suckers by the early settlers. This fruit, though only of second-rate quality, has so many good properties that we desire to present it to the Society. It is a profuse and regular bearer, though of small size; it is juicy and tender; may be eaten in the fall and winter, and is easily kept until spring. The country people frequently preserve them in open rail pens, simply lined and covered with straw. On the contrary, though a delicate fruit, it is deficient in flavor, resembling in its character that of the Westfield Seek-no-further, to which fruit it has many relations. We can not estimate it higher than second-rate.

Pryor's Red—In fine condition, firm and fresh. This fruit is deserving of high commendation for its many good properties. It varies much in its appearance, being sometimes green russetted, then dull orange russet, without a trace of red, or blushed to a greater or less extent, and again deeply red or striped, and sometimes almost black with depth of color. There may be different varieties, but *all* are characterized by richness of flavor, and the form that contains the greatest amount of material within a given compass, having a very small cavity and basin. Being a native of Virginia, it is found to succeed well in the Middle States.

Rawle's Janet—Always admired by your Committee, is again welcomed as a general favorite, sound, crisp, juicy and well flavored—a constant and prolific bearer.

Chinese Quince, Cydonia sinensis—This is a beautiful shrub, or small tree, rising from ten to twenty feet or less; of thrifty growth, upright and fastigiate in its ramification; foliage neat, close, and of a rich green color during the summer; the leaves are well retained until late in the season, when they become beautifully tinted with rich yellow and orange colors, and thus, in the closing scenes of autumn, they form a brilliant addition to the ornamentation of the lawn and garden. The flowers are large, abundant, of a lovely pale tint, very attractive in early spring; they do not always produce fruit, but in old trees a considerable amount has been observed.

The fruit is oblong, ovate, truncated at the ends; from three to five inches in length; skin smooth, dull green until ripe, when it becomes a rich golden yellow; flesh tough, astringent, and, as far as we know, not useful in the kitchen or table, but delightful in its fragrance,

which resembles that of the fruit of the Cydonia japonica. The fruit is said to be valuable for preserving.

The White Pippin and Newtown Pippin February 24th, were in fine condition, and indicated the value of these fruits. A fruit called *Titus Pippin*, the trees from Flushing, Long Island, so strongly resemble the White Pippin, that we suppose they are identical; these specimens being large, are the product of a young tree. *Smith's Cider* is in fine keeping order, and we are pleased to see that it may be so well and so long preserved in a sound condition. *Rawle's Janet* is now in fine eating order, and remains a prime favorite. *Tulpehocken* is somewhat wilted and soft, but still sound. *Virginia Greening* is sound and firm; though we cannot recommend this variety for the table, it keeps well, and will command a price in the market in the spring. We may make the same remark of the *Lansingburgh*—a great keeper, sound and firm, into summer *White Winter Pearmain*, sound and good, is growing to be a favorite. *Ashland* again appears before us, from R. Buchanan; a sound and good sweet apple of medium size. *Wine-sap* from the same, very beautiful, and in fine condition. The "Seedling," exhibited by Mr. Buchanan, is a very sound, well-keeping, hardy variety, of high flavor, which Mr. B. thinks will prove worthy of cultivation; but the Committee is not prepared to express an opinion respecting the merits of the fruit.

The Fruit Committee report that the specimens of Northern Spy are beautiful, fragrant, and well flavored. The Society being called in to their aid, a diversity of opinions were expressed as to their merits. Some of the members commended the fruit highly, and said they preferred it to any other fruit of the season; while others preferred the Rawle's Janet and the Newtown Pippin, as they are at this date.

The committee reported upon Bivort's Pomological work as follows:

The beautiful representations of fruits before us are exceedingly valuable; and as we understand that copies of the work may be obtained at Boston, we suggest the propriety of ordering the work. *Album Pomologie.*

This suggestion of the Fruit Committee was favorably received, and it was resolved that the matter be referred to the Council.

The attention of the members being called to the meeting of the United States Agricultural Society, Dr. Warder and Mr. J. K. Greene were appointed delegates from our Society to attend this meeting.

The death of Thomas Hancock being announced, an appropriate notice of that energetic friend of Horticulture and Pomology was unanimously adopted, and ordered to be entered on the records.

U. S. Agricultural Society.

The third annual session of this society was held, on February 28th, 1845, in the Smithsonian Institution. Twenty-six States were represented by accredited delegates from the State and county societies, and a large number of individual members of the Society was also present.

The Hon. M. P. Wilder, of Mass., President of the Society, on taking the chair, delivered a pertinent address, in which he recapitulated the operations of the Society during the past year, including the cattle show at Springfield, Ohio. The address was received with applause, and has been printed for distribution in pamphlet form.

A committee of one from each State represented was chosen by the President, to nominate a board of officers for the ensuing year.

Mr. Calvert of Maryland, offered a resolution recommending political action on the part of agriculturists, and supported it by able remarks.

He was followed by Messrs. French of New Hampshire, Dyer of Connecticut, and Kennedy of Pennsylvania, and the resolution was laid on the table for future discussion.

Mr. Jones of Delaware, presented a memorial, showing the effect of legislation upon agriculture, and embracing a mass of historical facts.

After having been read, it was, on motion placed on the files of the Society.

Mr. Clemson of Maryland, introduced a resolution recommending agricultural education.

An informal discussion of the potato rot, deep ploughing, and other matters of great agricultural interest followed, in which a large number of gentlemen participated. Many facts of importance were elicited, as gentlemen from various sections related their "experience," and the debate was continued until 4 o'clock.

In the evening the Society were favored by a lecture from their Vice President from Virginia, the venerable George Washington Parke Custis. His eloquent narrative of the illustrious "Farmer of Mount Vernon" was listened to with marked attention by a large audience, and was warmly applauded.

After the lecture a large number of ladies and gentlemen were introduced by the President to the orator.

OFFICERS ELECTED FOR 1855.

PRESIDENT.

MARSHALL P. WILDER, of Massachusetts.

VICE-PRESIDENTS.

John D. Lang, Maine,	J. T. Worthington, Ohio,
H. F. French, N. H.,	B. Gratz, Ky.,
Fred. Holbrook, Vt.,	M. P. Gentry, Tenn.,
B. B. French, Mass.,	Jos. Orr, Ind.,
Jos. J. Cooke, R. Island,	J. A. Kennicott, Ill.,
John T. Andrew, Conn.,	Thos. Allen, Mo.,
Henry Wager, N. Y.,	T. B. Flournoy, Ark.,
Isaac Cornell, N. J.,	J. C. Holmes, Mich.,
Isaac Newton, Pa.,	Jackson Morton, Fla.,
C. P. Holcombe, Del.,	T. G. Rusk, Texas,
H. G. S. Key, Md.,	J. W. Grimes, Iowa,
G. W. P. Custis, Va.,	B. C. Eastman, Wis.,
Henry K. Burgwyn, N. C.	J. M. Homer, Cal.,
James Hopkinson, S. C.,	Jos. H. Bradley, D. C.,
D. A. Reese, Ga.,	S. M. Baird, New Mex.,
A. P. Hatch, Ala.,	H. H. Sibley, Minn.,
A. G. Brown, Miss.,	Joseph Lane, Oregon,
J. D. B. De Bow, La.,	J. L. Hayes, Utah,
Gen. Whitfield, Kansas,	Mr. Giddings, Nebraska.

EXECUTIVE COMMITTEE.

John A. King, N. Y.	B. Perly Poore, Mass.
C. B. Calvert, Md.	A. Watts, Ohio,
A. L. Elwyn, Penn.	John Jones, Del.
J. Wentworth, Ill.	

SECRETARY.

WILLIAM S. KING, Boston, Mass.

TREASURER.

B. B. FRENCH, Washington, D. C.

After the election, the discussion upon the resolution offered by Mr. C. P. Holcombe, of Delaware, denouncing the "Reciprocity Treaty" as injurious to the agricultural interests of the Republic took place, Messrs. Holcombe, Peck, King, Jones, Waters, Elwyn, Kennedy, Steadman, Cowley, and other gentlemen participated. The resolution, as finally amended and passed, reads:

Resolved, That we object to the doctrine of free trade for agriculture and protection for other interests.

Col. Calvert of Maryland, offered the following preamble and resolutions, which he supported in an able and earnest manner, deprecating all applications to Congress, and urging political action on the part of agriculturists, as calculated to *command* success.

The resolutions, after having been discussed by Messrs. Kennedy of Pennsylvania, Jones of Delaware, and King of New York, prevailed.

Whereas, The prosperity of a country is in proportion to the improvement of its agriculture, therefore

Resolved, That agriculture should be the first interest considered in legislating for the general welfare, and that such legislation should be had as will foster and protect this interest, which is paramount to all others.

Resolved, That the time has arrived for the agricultureists of the whole country to meet in convention, and determine for themselves what legislation is necessary for their protection.

Resolved, That such a convention, to be composed of delegates from each State of the Union be earnestly recommended by this Society, in order that an agricultural platform may be established, which shall meet the views of, and be sustained by, the whole body of agriculturists as a profession.

It was agreed that this Society take measures to call a mass meeting of the farmers of the country, to be held in the city of Washington in the month of February, 1856 for the purpose of expressing their views upon the formation of such a platform.

Dr. Warder distributed specimens of the JAPAN PEA which was recommended as a valuable food for stock of various kinds and especially adapted, as a fodder and grain plant for the Southern States, he also laid before the Society a paper urging the importance of FLAX-CULTURE in the middle and northern States, not only for seed but for the fiber, which is now becoming a crop of vast importance

The constitution was so amended as to have the payment of ten dollars constitute life membership.

Various reports were read, among them one on the *Chess in Wheat*, from the Smithsonian Institution; on *Agricultural History*, by B. P. Poore; on *Mr Glover's Collection*, by Mr. Peck; and on *Western Fruits* from Dr. Warder.

Mr. Peck of Maryland, reported that the committee appointed to urge upon Congress the purchase of Mr. Glover's collection of modeled fruits, had had an interview with the proper committee of Congress, and received assurances that the matter would receive their attention.

A communication from Professor Henry was read, detailing experiments on the culture of the "Oregon pea," made under the direction of the Smithsonian Institution, at the request of the Society. The results at Savannah proved it worthless for that region.

A paper on "Alderney Cattle," by Dr. W. J. G. Morton was read and referred. Also, a paper on the "Potato Oat," from New York.

Dr. Warder of Cincinnati, exhibited some thirty different varieties of western apples, which he descanted upon with his wonted accuracy.

An invitation was received and accepted inviting the Society to visit the Metropolitan Mechanics' Institute to day at 11 o'clock. Invitations to visit the office of the Coast Survey and the agricultural room at the Patent Office were also accepted.

After some remarks by Mr. Custis, giving his experience in growing wheat in Virginia, the Society adjourned until 7 o'clock, when the Hon. G. P. Marsh addressed them on the *Rural Economy of Continental Europe*.

The lecture was listened to with great interest, embodying, as it did, a large amount of original information, and its publication will constitute a valuable addition to agricultural literature.

Dr. Warder followed with a lecture on hedges, which was replete with practical information.

After a discussion on the appointment of Commissioners to the Industrial Exhibition at Paris, the matter was referred to the Executive Committee.

On motion of Mr. Poore of Massachusetts, it was unanimously

Resolved, That the thanks of the United States Agricultural Society be presented to the Regents of the Smithsonian Institution, for the facilities afforded for holding this session. The utility of this Institution, in thus serving as a nucleus, around which all useful associations can rally, at the capital of our Republic, shows the wisdom of the course pursued by the present Regents.

On motion of Mr. Waters of Massachusetts, it was unanimously

Resolved, That the thanks of this Society be proffered to the Hon. Geo. P. Marsh, for the very beautifully written and exceedingly interesting lecture he was so good as to present to us last evening, and that Professor Henry be requested to wait on him and request a copy for publication.

Other customary and appropriate resolutions were offered and adopted, as in such cases it is expected there shall be, and the Society, after mutual congratulations and a felicitous fraternization adjourned, after three days session, to meet as usual on the 4th Wednesday of February of next year.

END OF THE VOLUME.